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THE UNIVERSITY OF ALBERTA

THE PSYCHO-EPISTEMOLOGICAL PROFILE

ITS

SCORING, VALIDITY AND RELIABILITY

by

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A THESIS

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PREFACE

Personality, perception, ideology, and cognition are areas which have been and are, matters of lively concern among psychologists. However, typically different concepts and methods have been employed to study the organizational aspects of these components of "total man". For example, the personality theorist thinks in terms of the organization of id, ego, superego, the self, personality syndromes and profiles, trait clusters, and personality types; theories of perception express their meaning in terms of core-context, the topological field, the cell-assembly, motor adjustment, adaptation level, directive state and the hypothesis; the student of ideology can describe personality and perceptual configurations as fascism, anti-semitism, fundamentalism, humanism, liberalism, and conservatism; cognitive theorists talk in terms of such concepts as cognitive styles, cognitive dissonance, frame of reference, the phenomenal field, and sign gestalten.

The extensiveness and detail of these theories bear witness to the complexity of the human psyche. It would be much more convenient if we could slice personality into its major faculties. From Plato onward writers have tried to do so, and there has been considerable argument that the major faculties are three in number: thinking, doing (willing), and feeling. Sometimes these are called cognition conation, and affection. D. C. McClelland, a contemporary theorist, has made use of this ancient trio by asserting that personality is composed of three kinds of units: schemata (cognitions), traits (habits of doing), and motives (affective dynamism). (McClelland, 1951).

While this kind of framework is artificial, it is certainly true that theorists speak of similar phenomena in varying words and phrases and from a particular point of view. To put it another way, it might be said that within the field of psychology, we all "see" the same mountain, but our vantage point is not the same. It is my opinion that a more powerful and simple way to proceed is to find a single set of concepts, equally appropriate to the analysis of personality, perception, ideology and cognitive behavior.

Some theorists, Freud among them, have held that our "thought-life" is essentially the servant of our needs and drives. If this viewpoint, taken by the "irrationalist" and others, were always so, one might well separate cognition from motivation. It has become evident however, that to do this is to overlook the fact of motivation in cognition. When we say that all men make an "effort after meaning" for example, we are saying that the desire to know is itself a motive, and that there are cognitive motives as well as drives to reckon with. In a very real sense then, motivation and cognition are one.

It would seem too, that there is a similar close association between perception and cognition. While the "core-context" theory of meaning suggests a "hard kernel" of experience which receives completion, or interpretation by addition, such a dualism is unrealistic and illogical. Gestalt physiologism has demonstrated that what is "given" in perception is not necessarily what "is". The perceptual laws of "closure", "pragnanz", "selection", "simplification", and so on, force organization of the "given" even before it reaches the "interpretive" phase of perception.

One could go on in this manner demonstrating how the psychological functions of personality are related, but to do so would in itself comprise a major paper. However, the following chapter of this thesis will review the work of theorists who:

1. Speak in terms of a total "life style"; or a person's distinctive way of living in the world. The theories are structural in nature and assume a functional wholeness. Each theorist slices the whole a little differently, but does not declare that everyone else's cuttings fall in the wrong place!

2. Analyse the whole in dimensional terms related to the mental life of man. The manner in which man derives meaning, acquires knowledge, and behaves epistemically is the central concern of the theories to be discussed.

The second chapter of this thesis concerns itself with the revision and administration of The Psycho-epistemological Profile (P. E. P.). The construction of the P.E.P. began in 1961 and a number of people since then have contributed in various ways to bring it to its present form. The definitions against which items were written for the four scales of the inventory (rational, empirical, intuitive and authoritarian), the inventory design, and the nature of the groups used for validation purposes, are given in this chapter. The construction of an inventory of good quality that would "call out" certain cognitive characteristics was an important aspect of this total work.

Chapter three deals with scoring the inventory. Two techniques were used (average rank order and the method of

successive intervals) and a comparison of resulting scores made. The purpose here was to determine whether an ordinal scale could be considered adequate for future scorings and statistical analysis.

The validity and reliability studies carried out are described in the fourth chapter of this thesis. The intent was to determine whether or not the P.E.P. is a valid and reliable instrument of those cognitive characteristics it was designed to measure. The methods used to get at validity and reliability and the results obtained are set forth at this point in the thesis.

The total work is covered in summary fashion in the last chapter and certain conclusions set out.

CHAPTER 1

COGNITION, PERSONALITY, AND THE SEARCH FOR MEANING

Joseph R. Royce in a paper entitled The Search for Meaning (1958), and later in a more elaborate form in The Encapsulated Man (Royce, 1963), presents a theory which concerns itself with man's distinctive way of living in the world and the dynamics involved in the structuring of a life style. "My thesis" he says, "is that the concept of structure pervades everything, and that it is the clue to the problem of meaning." (Royce, 1963, p. 101). Psychic content and function to the mind of Royce refer to structure, as structure explains why a particular content rather than some other has emerged. It is also Royce's contention that structure arises by way of heredity and conditioning forged through the physical and social environments.

The epistemological hierarchy set out by Joseph Royce is the basis of the empirical research of this thesis, so I shall move directly to a review of it. The hierarchy is defined in a four dimensional manner. The dimensions are referred to as "ways of knowing" and are labelled: rationalism, empiricism, intuitionism, and authoritarianism.

These dimensions are not mutually exclusive aspects of man's psychological existence, but rather all are operative to some extent within the life style. More important however, is the fact that one way of knowing will be valued more highly by the individual than the others. Let us look more closely now

at these four dimensions or value orientations. The following descriptions are taken in part from The Encapsulated Man (Royce, 1963):

1. Rationalism. The individual who is disposed to the rational mode is primarily interested in knowledge "par excellence" - highly intellectual data. He is more at home manipulating ideas, for example, than he is perceptual knowledge. As a consequence such a person is psychologically set to accept as true that which is reasonable or logical. This way of knowing does not exclude intuitive, sensory and other psychological components, but the primary process employed by one who knows "rationally" is thinking. He has the faith that clear thinking will lead him to the truth, and conversely, that illogical or fuzzy thinking will not. The criterion for truth for such an individual therefore, takes the form of a logical-illogical continuum.

2. Empiricism. This psychological mode disposes the individual to accept as true that which is given via sensory experience. "The empiricist stays close to nature and spells observation with capital letters." If one cannot see it, smell it, touch it, or hear it, it does not exist in any true sense. Valid knowledge is come by through the perception of daily living and rigorously controlled experimentation. When inaccurate, knowledge is illusory or false. Hence this dimension of knowledge rests along a perception-misperception continuum.

3. Intuitionism. The intuitionist claims that he knows by immediate or obvious apprehension. He is disposed to accept

as true that which he senses to be so with his whole being. This epistemological position encompasses both the "hunch" and insight which comes after careful and complete consideration. Though one is hard put to give a detailed description of the intuitive dimension of knowledge, considerable evidence could be presented to support its existence and the findings of this research strongly indicate that there are those who employ it as a way of knowing. Royce suggests that intuition is primarily dependent upon subliminal perceptual processes. Not necessarily subliminal cue reception, which is a special case of intuition, but rather the non-clear perception of stimulus configurations embedded in symbolic material. This means that the usual principles of perception apply: grouping, closure, the law of pragnanz, and so on, and that the person who is said to be intuitive, is particularly able to pick up the appropriate stimulus configuration in spite of the fact that it is essentially hidden or disguised. "Intuition is primarily a perceptual feeling process with strong unconscious elements and it may also be found that it is a primitive mixture of the sensory and thinking processes of empiricism and rationalism." (Royce, 1963, p. 118). The resulting continuum takes the form of insight-no insight.

4. Authoritarianism. If a person values highly this way of knowing, he will accept as true information backed by someone who is judged to be an authority. The philosopher Descarte for example, decided to discard as false all knowledge that others claimed to be true. He would start anew and work through to what was true in all areas of knowledge. Descartes

represents a non-authoritarian man; one who disemployed this dimension of knowledge. This way of knowing, which is represented on an ideological-delusion continuum, is viewed by Royce as a legitimate approach to reality for a number of reasons.

The first reason is because of the sheer impossibility of proceeding otherwise. Efficiency and action demand that certain things be accepted as true without argument, reflection or experimentation. For example, one has no alternative but to believe the authoritative word of science that the distance from the earth to the sun is 96 million miles. The average man must believe this for he has no ready means of proving it empirically for himself.

Secondly, we are all victims of tribal conditioning. Parents must be authoritative in their role as a father or mother. Children learn to accept without question many of the statements of their parents. Thus a child may carry the mode of accepting rather than questioning over into adulthood. Also from infancy on we take on ways of looking at things which are handed down to us by culture. One example in point would be the Eastern stress on intuitive approaches to reality in contrast to Western empiricism.

Thirdly and most important of all, belief is the basis of all ways of knowing. One may not proceed in any quest for knowledge without making certain assumptions, and these first principles are always arbitrary or authoritarian in nature. The empiricist makes the assumption that sensory input should receive priority in seeking truth; the rationalist assumes internal consistency

as primary; the intuitionist believes the acid test of truth to be an "intuitive feeling" about it; the authoritarian looks to a prestige figure for the nod first and foremost.

In the preceeding pages we have reviewed a theory which postulates four dimensions of knowledge operative within the psychological existence of man. Individual men are predisposed by their physical and social environments to prefer one way of knowing ahead of others. Such value orientations lead individuals to accept "truth" of a particular kind and refuse hearing to other kinds. To put it another way, the inner psychological sub-structure of an individual will structure reality for that individual. Within the life style of each individual the rational, empirical, intuitive and authoritarian dimensions of knowledge exist, but these are arranged in a varying hierarchical fashion. The mode most valued by the individual will be given top spot and trusted foremost; the other three will fall in differing ways as secondary, tertiary, and fourth place. One man may be extremely rational, highly empirical, slightly intuitive and unauthoritarian in his search for meaning. The epistemological hierarchy of another may be the complete reverse, and it is conceivable that every hierarchial arrangement possible does exist "a given individual characteristically relies more on one or two of the basic approaches to reality than upon others. The typical scientist for example, would be likely to have empiricism and rational at the top of his profile, with intuition and authoritarianism at the bottom. The laboratory man's profile might read

empiricism, rational, intuitive, and authoritarianism

Artists, in general, would have a profile with intuition near the apex. And an ardent member of a fundamentalist religious group would reflect a profile somewhat as follows: authoritarianism, empiricism, rationalism, intuitionism." (Royce, 1963, p. 120).

The more general, all pervading personality disposition or life style, which encompasses all ways of knowing, is represented by Royce as on a continuum between "encapsulation" and "unencapsulation". The encapsulated man has a very limited reality image. All that is not in keeping with his way of knowing is excluded. The man who is not tied to one and only one of the dimensions of knowledge can be said to be unencapsulated. It would appear that the completely open individual would have an equal freedom along and among the four dimensions.

With Royce's theory in mind, let us turn now to a consideration of related theories.

C. G. Jung. In a book entitled, Psychology Types, (Jung, 1923) Jung sets forth a "psychology of individuation". While Jung's approach to personality is typological in nature and that of Royce a trait-continuum approach, the theories are not unrelated.

Both theorists purport a definite style of personality and specific functional attributes. As we have seen Royce sets forth the four cognitive processes of empiricism, rationalism, intuitionism, and authoritarianism. The first three of these relate to the Jungian functions of sensing, thinking, and

intuition. The sensing individual is interested in what is happening around him which can be touched, heard, tasted, etc.; the intuitive person is captured by possibilities other than those "out there", (in indirect perception by way of the unconscious and ranging from the masculine "hunch" or "woman's intuition" to the crowning creative act or scientific discovery); the thinking individual employs and develops the logical process of mental life. The feeling function of Jung's theory has one point of similarity to Roycean authoritarianism; that being, it is an apperceptive process. The feeling of like or dislike supercedes the other functions. It is a matter of belief more than of considered opinion. However, it is not likely that Jung's feeling type would be as definite or determined in his "view" as the authoritarian value orientated individual. Authoritarianism also includes perceptive elements. It is both apperceptive and perceptive by nature.

The cognitive life of man is the core of personality in the view of both Jung and Royce. Jung proposes that sensing, intuition, thinking or feeling may be carried on in a judging or perceiving mode. Judging-perceiving describes the prominent nature of cognitive activity. When functioning in a perceptive mode, each of the four processes seek more information. When judging, perception is "shut off" and a verdict is achieved. Encapsulation-unencapsulation are the common denominators of Royce's theory and are not unlike judging-perceiving. When encapsulated an individual shuts off all processes other than

the one he prefers. For example, if encapsulated and empirical in cognitive style, a person will judge higher intellectual data, the data of belief, and that of inner sounding, irrelevant. The unencapsulated individual is most perceptive to use Jung's term, and seeks to be fully informed before passing judgement.

While encapsulation-unencapsulation is the major dimension of life style in Royce's theory, judging-perceiving is not in Jung's theory. Introversion-extroversion are the major attitudes of total man suggested by Jung. The introvert's main interests are in the inner world of ideas and concepts, while the extrovert's are in the outer world of people and things. These two theories then, have a definite difference of emphasis. Royce separates men in terms of the specific variety of cognitive activity. It is true that Jungian theory in a broad sense is an analysis of the way people prefer to use their minds, but it is not as highly cognitive in nature as Royce's theory. Royce is more specifically concerned for epistemic behavior; Jung for psychological behavior in the more general sense.

The Myers-Briggs Type Indicator (Myers, 1962) is a personality inventory developed from Jung's theory. Myers adapted Jung's theory somewhat in that she considers judging and perceiving as independent cognitive functions, rather than aspects of the other four functions (i.e., sensation, intuition, thinking, and feeling). As a result the test has a four dimensional basis: extroversion-introversion, judging-perceiving, sensation-intuition, thinking-

feeling. The extroversion-introversion scale gives the focus of cognitive activity, the judging-perceiving scale gives the prominent nature, and sensation, intuition, thinking and feeling involve its specific variety.

The theoretical implications of Royce's theory have resulted in the construction of a four scale inventory entitled The Psycho-epistemological Profile. The dimensional bases of the test are: logical-illogical, insight-no insight, perception-misperception, and ideology-delusion. These of course, relate to the cognitive processes of thinking, intuition, sensing, and believing as described earlier. The writer of this thesis has been actively engaged in the writing, administration, scoring and resulting analysis of this inventory. A description of same will be given later, but at this point it can be said that empirical studies on The Myers-Briggs Type Indicator give some, though meager, support to those aspects of Jung's theory which relate directly to ways of knowing postulated by Royce. In an evaluation study done, A Description and Evaluation of the Myers-Briggs Type Indicator (Stricker & Ross, 1962) retest reliability on the thinking-feeling scale rendered a correlation of .84. A concurrent validity study, comparing The Myers-Briggs Type Indicator with the Gray-Wheelwright Psychological Type Questionnaire, gives phi coefficients between the corresponding scales of .34 for sensing-intuition and .54 for thinking-feeling. The researchers conclude that the indicator attempts to measure similar variables to those of the Study of Values (Allport-Vernon-Lindzey, 1960) and the above mentioned questionnaire and until a

factor analysis is done, it will not be known whether or not it taps any new variable.

Leon Festinger. Here we have another theorist who views psychological function as highly cognitive in nature. His theory of "cognitive dissonance" has the ability to integrate materials from seemingly different areas and views the higher psychological processes as self-motivated. The theory centers around the idea that if a person knows various things that are not psychologically consistent with one another, he will try in a variety of ways to make them more consistent. "Two items of information that psychologically do not fit together are said to be in a dissonant relation to each other. The items of information may be about behavior, feelings, opinions, things in the environment and so on." (Festinger, 1962). Where dissonance exists there are two major ways of reduction. The individual may make an effort to persuade himself that the choice he has made between two equally attractive pieces of information was the right one; that it is in fact more attractive than the one rejected. On the other hand, he may seek further justification for the choice he made.

One specific relationship between the theory of cognitive dissonance and the ways of knowing is seen in this hypothesis: "when dissonance is present, in addition to trying to reduce it, the person will actively avoid situations and information which would likely increase dissonance." This implies as Royce contends that people value the "truth" they know, tending to become encapsulated by it and by the process which led them to it. Word has recently been received that a student working with

Festinger, plans to do research which bears on this relationship.

A second point of juncture between the two theories is evident in the ways an individual reduces dissonance. As mentioned earlier these are, self persuasion and a search for new evidence. The rational and empirical processes respectively are parallels of the latter dissonance reducing means. This however, is a personal assessment and to date Festinger has not carried out any empirical research which relates to Royce's theory.

Festinger and Royce agree that cognitive activity is self motivated, and as is the case with Royce, Festinger purports a prominent psychological dimension. Though somewhat different in nature, it is consonance-dissonance. It might be said that when encapsulated one is not likely to become disturbed or know dissonance; when unencapsulated, it is certain.

While these theories have the above points of similarity, essentially they are different. The cognitive processes are the main concern of Roycean theory and the word cognitive for Festinger simply emphasizes that the theory deals with relations among items of information. The way information affects cognitive function is Festinger's foremost concern; Royce is interested first of all, in the effect of organizing forces on reality. Royce tells us why people believe as they do and Festinger explains how beliefs may change.

D. E. Berlyne, Festinger's theory is highly cognitive and does not dip as deeply into the more apperceptive psychological nature of man as does that of D. E. Berlyne. Berlyne sets forth a theory which parallels that of Festinger's in many ways, but

which views epistemic motivation in terms of the more general notion of "conflict". He agrees with Royce that epistemic behavior has a cognitive impetus. He says "epistemic curiosity will increase with the degree of conceptual conflict or conflict between symbolic response tendencies - beliefs, attitudes or thoughts." (Berlyne, 1962, p. 27). His theory relates to Royce's then, by way of a cognitive drive.

A second similarity is seen in his description of epistemic behavior itself. "Epistemic behavior can be divided into three categories, namely epistemic observation, which includes the experimental and other observational techniques of science, consultation, which includes asking other people questions or consulting reference books, and directed thinking. Directed thinking, like autistic thinking consists of a chain of symbolic responses, but it differs from the latter in its epistemic function, since autistic thinking aims rather at the nonepistemic enjoyment of internal stimulation, whether akin to the enjoyment received from exploratory behavior or acting as a substitute for organic gratification." (Koch, 1963, p. 322). Observation is not unlike the empirical way of knowing and consultation is a little like the authoritarian attitude. Directed thinking however, points up the difference between the thinking of both Festinger and Berlyne and Royce. Cognitive processes are not so much a mode of thought which relate to a definite structure, they are simply reactions of a mental nature which utilize a very small type structure or cognitive "element". Royce considers cognition as structured into meaningful wholes in a way that Berlyne does not.

Milton Rokeach. In a book entitled The Open and Closed Mind (1960) Rokeach postulates a generalized state of mind which is nearly equivalent to encapsulation-unencapsulation. The terminology he uses is open-closed. "It is possible to say that to the extent to which a person's belief system is "open" or "closed" is a generalized state of mind which will reveal itself in politics and religion, solving of intellectual problems, the way he works with perceptual material and the way he reacts to an unorthodox musical composition." (Rokeach, 1960, p. 7).

It must be noted however, that this aspect of Rokeach's theory refers to mental structure and that the structure, be it characteristically open or closed, effects all aspects of cognitive function. For Royce encapsulation-unencapsulation is of a molar nature, yet it does have a specific reference. An individual may be encapsulated or unencapsulated in one of four ways of knowing.

Rokeach and Royce also speak in similar terms in the area of belief-disbelief. You will recall that belief-disbelief for Royce is a definite cognitive dimension or value orientation. Rokeach however, talks of a general belief system and within this system, beliefs of a specific variety. "The belief system is conceived to represent all the beliefs, sets, expectancies, or hypotheses, conscious or unconscious, that a person at a given time accepts as true of the world he lives in."

Beliefs of a particular nature are placed in these categories: ideological system, institutionalized sets of beliefs; the conceptual system, logically consistent sets of beliefs; the perceptual system, sets of beliefs which have shown themselves to be true; the esthetic system, sets of beliefs one acquires early about the world in which he lives..

These wheels within the larger belief system wheel, are related to Royce's ways of knowing in this order: authoritarianism, rationalism, empiricism, and intuitionism. But the systems set forth by Rokeach are described in terms of cognitive content, while Roycean definitions are given in functional-structural terms.

In summary, it may be said that the thinking of Rokeach relates most directly to the authoritarian aspect of Royce's theory, but even here there is a difference of approach.

A thorough search of the literature has been undertaken and there are other men who have written theories related to our area of concern. Fritz Heider's "theory of cognitive structure" (1946) addresses itself to structural details of cognition. R. Ableson (1954) has a theory of "cognitive imbalance" which is anchored in a general theory of attitudes. Jean Piaget has done a monumental piece of work which suggests "assimilation" and "accommodation" as key cognitive processes which relate to structure or "cognitive schema". This work is reviewed by Flavell in a book entitled The Developmental Psychology of Jean Piaget (1963). Eli Alson has written a dissertation entitled, Cognitive Structure and Dogmatism (1959) which is bent in the direction of the Rokeach

theory. Robert Zajonc, in Cognitive Structure & Cognitive Tuning (1955), explores concept formation and cognitive functioning.

The emphasis of the work done by the above mentioned however, is not specifically epistemological in nature, and in essence is similar to theories discussed earlier in the chapter. One area of Piaget's writing deals with genetic epistemology, but he is at heart a developmental psychologist and sees cognitive structure as more unstable or changing rather than enduring.

The theories we have reviewed have all suggested a life style, or a person's distinctive way of living in the world. It is difficult to study such total life styles in an empirical way, although many studies of "value orientations" do approach this level. It is somewhat easier to study a relatively limited disposition in respect to which men may be compared. Sometimes these are called "perceptual response dispositions", or "personal constructs" or simply "cognitive style".

I will proceed now with a review of the theory set forth by E. Spranger which is definitely relevant, value oriented, and in which the Allport-Vernon-Lindzey Study of Values (1960) is rooted.

Spranger defines six major value types. He contends that every person can be regarded as approaching (but not fitting perfectly within) one or more of these value directions. Human life, it seems to Spranger, harbors six main types of values which appeal in varying degrees to individuals who build the unity of their lives about them. Spranger does not argue that there are

six main types of people. The typology is one of value and not persons. The "ideal type" does not infer that types are necessarily good or bad or that they are ever found in pure form, but rather a "schema of comprehensibility" or gauge by which we can tell how far a person has gone in organizing his life by one or more of these basic schemes. (Spranger, 1928). Detailed scheme descriptions are given in the manual of the Study of Values, but I shall only refer to them briefly here;

1. Theoretical. The interests of the theoretical man are empirical, critical and rational; he is frequently a scientist or a philosopher.
2. Economic. This man is characteristically interested in what is "useful".
3. Esthetic. The esthetic man chooses with Keats to consider truth as equivalent to beauty.
4. Social. The highest value for this type of person is the love of people.
5. Political. The political man is interested primarily in "power".
6. Religious. This type person is mystical, seeking to comprehend the cosmos as a whole and to relate himself to its embracing totality.

Rationalism, empiricism, intuitionism, and authoritarianism, as defined by Royce, are also value orientations and have features in common with the six basic schemes noted above.

The rationalist is similar to Spranger's theoretical type in that both seek to think and to reason. Both aim at the systematization of knowledge, prize logic and intellectual consistency. Observation is also a basic concern of the theoretical man, which is not so for the rationalist. Experimentation, observation, etc. are the meat of the empiricist in Roycean theory. A definite dimensional distinction is drawn between the two by Royce.

The esthetic and the religious schemes of Spranger fit within Royce's intuitionism. The esthetic is interested in the artistic episodes of life and experiences related to these. The religious type finds his greatest satisfaction in the inner world of experience. Both these statements are true of the intuitionist, who seeks truth by way of the "symbol" rather than the "sign", and who listens closely to the urgings of the inner man.

External validation studies described in the Allport-Vernon-Lindzey Study of Values Manual indicate that the scores of groups whose characteristics are known scored high on the scale they were expected to do well on. Graduate students of Education for example, stood relatively high in theoretical values.

Reliability by retest was good on the scales related to the Roycean dimensions. After two months with n equal to fifty-three, the theoretical r was .85; the esthetic r was .87; and the religious r equalled .93. (Allport-Vernon-Lindzey, 1960)

In general and by way of summary, it may be said that Royce sees value as the bridge between meaning and personality and it plays an exceedingly important role in his system. Value is implicit in the four ways of knowing; all persons value one or two of these ways ahead of the others, and it is this primarily, that sets the cognitive style and nurtures the related cognitive process. Royce and Spranger however, have a different point of departure. You will notice that Spranger's value systems relate to broad areas of interest or career pursuits - political, economic, social, etc. For Royce however, value relates more to the psychological processes and resulting cognitive structure. The one discovers his theoretical cue in the social environment and the other in the mental life of man.

In closing this literature review I should like to make brief reference to the research which has been done on authoritarian character structure. The widely known investigation of the "Authoritarian Personality" by Adorno, Frenkel, Brunswik, Levinson, and Sanford (1950) resulted in considerable research. The California F Scale was constructed in 1950 and since its publication has been used in literally hundreds of investigations. The publication of the F scale, along with evidence for its validity, appeared in a book under the title of "The Authoritarian Personality".

The work done in this area gives considerable support to the cognitive dimension of belief-disbelief as outlined by Joseph Royce. While the F, or Fascism scale, was designed to measure

prejudice without the mention of the names of specific minority groups and personality predispositions toward a fascistic outlook on life, the originator's expectations about it were borne out. The facistic outlook and the content of belief are not the concern of Royce, but the inferred structure is. If content implies structure, and many including Piaget and Rokeach believe it does, then we are safe in saying that individuals may have a pervading tendency toward an authoritarian cognitive style.

CHAPTER II

TEST REVISION AND ADMINISTRATION

Epistemologies Defined

The purpose of the University of Alberta Psycho-epistemological Inventory is to attempt a measure of the rational, empirical, intuitive and authoritarian "styles" of personality. Therefore, before a single item could be written it was necessary to clearly define the characteristics of rationalism, empiricism, intuitionism, and authoritarianism. The following are definitions worked out by myself and others who have taken an active part in the construction of this inventory. Naturally, these are centered in the "ways of knowing" outlined by Joseph Royce.

Rational: The rational process may be defined as a method of arriving at a truth which involves valid reasoning based upon correct premises. The essence of the rational process is that it involves thinking, and conscious understanding of each step in the reasoning procedure.. An attempt is made to eliminate feeling as far as possible. The rational process is dependent entirely upon the criteria of the validity of the premises and the reasoning process - external criteria are not needed, since the crucial thing is internal consistency.

Empirical: The empirical process arrives at truth through sensory (or experimental - more broadly) "proof" of external verification. The empiricist says, "It is not enough that it be logical, it must also be reproduceable." That is, while logic

is a nice addition to the empirical process, the crucial step is external validation.

Intuitive: The intuitive process may be defined in two ways:

1. Intuition is subliminal adding-up of cues leading to conscious "insight" or sudden understanding. The assumption is that this process can be analysed and that, when this is done, the process will be seen to be rational. This process appears to serve the function of efficiency.

2. Intuition may be defined, on the other hand, as an unique process, which involves "strong feeling"; a hunch or notion. This strong feeling may outweigh the other processes and provide cognitive structure.

Authoritarian: The authoritarian process involves a strong belief in something on the basis of an uncritical acceptance of another's statement. This is, of course, dependent upon the other individual holding sufficient prestige for the believer - that is the believer feels that the statements are true in an almost direct ratio to the prestige of the person uttering them. One could almost say that the authoritarian process is dependent upon who said it, the rational process upon how it was said (or arrived at), the empirical process being dependent upon objective sensory "proof" and the intuitive process upon subjective "insight" (or sudden understanding with feeling involved).

Inventory Design

With the above four definitions in mind items were composed and designed to "call out" each of the four epistemological approaches.

Working from an opening statement, each item lists four alternatives, and each alternative relates to one of the four "ways of knowing". The hypothesis here is that each individual in his "search for meaning" will rely more on one or two of the roads to meaning and that his bias or style will become evident in the item alternatives he selects. The opening statements derive from all areas of experience: political, scientific, religious, business, the home, and family, and so on. All opening statements are general in nature, are nonleading, yet designed to arouse interest. The alternatives are designed to differentiate clearly, but not obviously, among the ways of knowing, to be equally attractive whether in fact or fiction, and to be equally valid from the standpoint of social acceptability.

Item writing began in 1961, at which time students in an advanced course in psychometric theory designed forty-five four alternative items. These items comprised the preliminary form of the test. Subsequently two equivalent forms, Form U.-1 and Form U.-2, each with 75 items, were written by Professor Royce and a team of student assistants (S. Heeren and M.S. Rawat). This "experimental form" of the test was given to a small group of graduate students in Mathematics, Biology and Classics. Note that these academic areas or disciplines of knowledge relate to the rational, empirical and intuitive epistemologies. The results were not conclusive, but did give support to the idea of an epistemological heirarchy of the nature proposed by Royce.

The writer, working under the guidance of Professor W.A.S. Smith, picked up the work at this point. Working from a critical

study of the 150 items of the two forms completed earlier and from person assessments, many of the items were discarded. All items retained were revised and a number of new items were written. By this analytical sifting and writing procedure, 101 items with four alternative choices were included to compose The University of Alberta Epistemological Profile (Revised Experimental Form I). *

It is granted that the inventory is lengthy, but not without purpose. The length of the test, presuming all items are of high quality, will be a positive factor in reliability. Also, good test construction suggests that roughly double the number of items intended for the final form of a test be included in its first form. The test as described above is included in appendix A of this thesis.

The directions of the inventory describe the test format and the manner in which to proceed when answering. Subjects are asked to rank order the alternatives under each situational statement. They are asked to indicate their first choice, then their last choice, and then their second and third choices. This is done by affixing the number 1 to the first choice, 4 to the last, 2 to the second and 3 to the third. The subjects are asked to proceed in this way to assist them in the discriminial process; to help them "peg" their choices. That this instruction was needed became apparent from experimental work done with an earlier form of the P.E.P. The task of rank ordering without it was most frustrating. The rank ordering procedure is used, rather than a single first choice selection in the interests of theory, efficiency, and scoring. The assumption is that all alternatives will have cognitive signifi-

* The inventory was given this name for experimental purposes so as to disguise the underlying psycho-epistemological theory.

cance, and therefore none should be discarded by the subject. Rank ordering provides more complete data and the scoring procedure to be used has scope enough to employ all data rendered in this way. The set-up of the answer sheet (Appendix B) and its use is also outlined in the instructions. The inventory does not have a time limit; the average testing time runs close to one hour and thirty minutes.

Test Administration

The Sample and Group Definitions.

The inventory was written by a total of one hundred and eighty-three subjects. In the interests of reliability of sampling an effort was made to obtain a good sized sample. This total population included "four types of men": rational, empirical, intuitive and authoritarian. On an "a priori" basis, it was decided that people committed to specific pursuits would be predominantly rational empirical, intuitive, or authoritarian in their cognitive style. We assumed that those committed to working in the laboratory would be highly empirical; those committed to logic, rational; those in the realm of the "symbol", intuitive; and those with careers involving them in the giving and carrying out of orders, authoritarian. Four subgroups were thus chosen to be composed of subjects in particular epistemological ruts.

The empirical subgroup of forty-eight in number, was composed of post-graduate students from chemistry, zoology, entomology and biology. These scientists were of the experimental variety. Two of the professors in this area assisted in the sample selection. This group will be referred to as "Chem-biology".

Able assistance was also given by a professor of physics in the selection of those for the rational group. Post-graduate students in theoretical physics, theoretical chemistry, and a number from the department of mathematics and philosophy, helped to fill out the sample. We were particularly hard pressed to find subjects for this category and finally sought assistance outside our own University campus. By way of interdepartmental connection between psychology here and at The University of Washington, additional subjects in the field of mathematics and physics were procured. In this area, a total of forty-four subjects completed the inventory. This subgroup was named "Math-physics".

Subjects for the intuitive group were also difficult to find. A number of post-graduate students in literature, drama and art from the University of Alberta, Edmonton, took the inventory and also twenty-five Mount Royal Conservatory of Music students, Calgary. The latter subjects were all at the grade ten level or better in the music program. As can be seen, an honest effort was made to control the educational level of all subjects. A total of fifty men and women were obtained for this group. "Music-drama" was the label given to the group.

The authoritarian category posed a somewhat different problem - the problem being where to turn for subjects highly authoritarian in style. Students of law and history were considered as possibilities, but it was decided that the reasoning process could be as important, if not more important to such

studnets. After considerable thought it was decided to turn to the military for the authoritarian sample. Upon discussing the intent of the inventory with an Air Force Commander and an Army Major in personnel work it was thought that the army officer would best serve our purpose. Officers were chosen in order to maintain the educational requirements, and the army man because of the greater emphasis on discipline. Men who had come up to officer status through the ranks would likely have been our "ideal" subjects, but to obtain this type of person could not be accomplished in every instance. A group of forty-one army officers, career men who had gained their rank by commission and otherwise, were finally obtained and tested. These forty-one compose the "Military" group. All are posted here in Edmonton at Griesbach.

Most of the Chem-biology and Math-physics subjects took the inventory in a group situation. The writer read through the directions with those taking the inventory, observed reactions during the test period, and answered any questions that came up while the test was in progress. On the whole there was little confusion with regard to the instructions or over individual items. Motivational level was excellent and most students worked with interest and dispatch.

The inventories completed at Mount Royal College and The University of Washington were not supervised, but verbal orientation was given to all subjects and they were asked to complete the inventory at one sitting. The army officers received the inventories in the mail along with a covering letter.

By far the greater percentage of subjects in every subgroup completed all or most of the items and a surprisingly high number requested an analysis of their results. The inventories were written in every instance on a voluntary basis and were admirably completed.

CHAPTER III

SCORING THE INVENTORY

A secondary but important aspect of this thesis, is to make an effort toward precise scoring. Such efforts have not been made to date. The method used in scoring the Allport-Vernon-Lindzey Scale of Values, for example, is not refined in the sense that it might be. This is also true of other tests of similar nature. It may well be that the procedures used are adequate, but the point is that available and more refined techniques have been ignored. It was decided therefore, that the Psycho-epistemological Profile should be scored by a coarse and refined technique and a correlation run as a test of equivalence.

The "Average Rank Order" (A.R.O.) method of scoring was one technique employed. This was used on a 4, 3, 2, 1 basis.

You will recall that the Psycho-epistemological Profile is composed of one hundred and one items with four alternatives under each item. Each of the alternatives has reference to the empirical, intuitive, rational or authoritarian way of knowing. The result then, is a four scale inventory with 101 items on each scale. If a subject answers all items he will have placed the 101 empirical items in ranks 1, 2, 3, 4. This will also be true for the intuitive, rational and authoritarian alternatives.

For example, the following are the results of subject number 3 of the Math-physics group:

TABLE I
RANKS ASSIGNED TO EMPIRICAL, INTUITIVE, RATIONAL, AND
AUTHORITARIAN ITEMS BY SUBJECT #3 - MATH-PHYSICS GROUP

	Ranks				
Scales	1	2	3	4	Total
Empirical	23	33	23	22	101
Intuitive	28	20	22	31	101
Rational	36	26	24	15	101
Authorit.	14	22	32	33	101

The numbers in the squares represent frequencies. It can be seen that of the empirical items this subject designated 23 as his first choice, 33 as second, 23 as third and 22 as fourth. The score for this subject on the empirical scale was derived thusly:

$$\frac{(23 \times 4) + (33 \times 3) + (23 \times 2) + (22 \times 1)}{101} = 2.643$$

His score on the intuitive scale was 2.347, on the rational scale it was 2.960, and on the authoritarian scale 2.050. The A.R.O. scores for all subjects by groups are included in Appendix C.

The scaled scoring technique employed was "The Method of Successive Intervals" (Edwards, 1959, p. 120). It is an adaptation of "The Method of Paired Comparisons". The method of successive

intervals requires but a single judgement for each subject for each statement to be scaled, whereas the paired comparisons method requires that each statement be compared with each of the other item alternatives. It does not assume as does "The Method of Equal Appearing Intervals" that the intervals derived are equal, but it does render a continuum of measurement approaching the ratio type scale.

The method of successive intervals renders subject scores in terms of sigma units. This is desirable of course since the sigma unit is the common denominator of psychological measurement. Such interval scale scores reflect the traditional mathematical characteristics of additive numbers and are therefore amenable to the usual parametric statistics.

Beginning with the frequency scores of the total population, the method establishes a common psychological continuum from the medians and discriminial dispersions of all stimuli.

Each subject places a certain percentage of all item alternatives in ranks 1, 2, 3, 4. Once these percentages are known for each subject the results are pooled to establish a normative distribution by percentage. It may be said when this has been done, that in the general case, a certain percentage of all items were ranked as 1, a certain percentage were ranked 2, 3, and 4. By an accumulation of these percentages, followed by transformation to Z scores, the average distance between scale intervals is determined for the total sample. Individual scale values in sigma units can now be determined as a function of these group interval widths and individual medians and discriminial dispersions.

To illustrate the procedure I am including here the data sheet of subject number 3 of the "Music-drama" group :

TABLE II
DATA SHEET - SUBJECT #3
MUSIC-DRAMA GROUP

Empirical					Intuitive			
	1	2	3	4	1	2	3	4
f.	22	21	27	20	12	23	25	30
Cf.	22	43	70	90	12	35	60	90
Cp.	.244	.477	.777	1.00	.133	.388	.666	1.00
Z	-.693	-.058	.762		-1.112	-.285	.429	
.	2-1	3-2			2-1	3-2		
Wi.	.635	.810			.827	.714		
Rational					Authoritarian			
	1	2	3	4	1	2	3	4
f.	13	26	23	28	43	20	15	12
Cf.	13	39	62	90	43	63	78	90
Cp.	.144	.433	.688	1.00	.477	.700	.866	1.00
Z	-1.063	-.169	.490		-.058	.524	1.108	
.	2-1	3-2			2-1	3-2		
Wi.	.894	.659			.582	.584		

You will note that Table II includes data from the four scales: empirical, intuitive, rational and authoritarian. The numbers 1, 2, 3, 4, represent the ranks; f is frequency, Cf is

cumulative frequency; CP is cumulative proportion; Z is the normal deviate corresponding to proportions; W_i is the width of the interval between ranks 1 & 2 and 2 & 3.

The general yardstick of measure was obtained by summing the distances between intervals 1 & 2 and 2 & 3 for all subjects on all scales and computing an average. The general psychological continuum was obtained as below:

TABLE III
AVERAGE WIDTH BETWEEN INTERVALS 1 & 2, 2 & 3
FOR
THE FOUR GROUPS ACROSS THE FOUR SCALES

	Chem-Bio Grp.		Mus-Drama Grp.		Math-Phys. Grp.		Military Grp.	
	Int. 2-1	Int. 3-2	Int. 2-1	Int. 3-2	Int. 2-1	Int. 3-2	Int. 2-1	Int. 3-2
Empirical Scale Av.	.796	.754	.741	.718	.737	.736	.710	.613
Intuitive Scale Av.	.840	.764	.634	.660	.720	.730	.664	.640
Rational Scale Av.	.789	.770	.733	.707	.713	.712	.697	.588
Authorit. Scale Av.	.792	.746	.793	.663	.655	.758	.686	.596
Total	3.217	3.034	2.801	2.753	2.825	2.936	2.757	2.437
Number	4	4	4	4	4	4	4	4
W _i	.804	.759	.700	.688	.706	.734	.689	.609

TABLE IV
AVERAGE WIDTH BETWEEN INTERVALS 1 & 2, 2 & 3
FOR
THE TOTAL POPULATION.

	All Scales	
	Interval 2-1	Interval 3-2
Chem-Biology Group	.804	.759
Music-Drama Group	.700	.688
Math-Physics Group	.706	.734
Authoritarian Group	.689	.609
Total	2.899	2.790
Number	4	4
Wi	.725	.697
Wij	.725	1.422

Once the normative Wi (interval width) and Wij (cumulative interval width) was obtained, the scoring for each subject on each scale could be done.

The formula used for individual scoring by scales was:

$$S_i = l + \left(\frac{50 - \sum P_b}{P_w} \right) \bar{W}_{ij} \quad (6, p.129)$$

where S_i = the scale value on the scale; l = the lower limit of the interval on the Psychological continuum in which the median falls
 $\sum P_b$ = the sum of the proportions below the interval in which the median falls; P_w = the proportion within the interval in which

the median falls; W_{ij} = the width of the interval on the psychological continuum.

Substituting in the above formula to find the scale value for subject #3 of the Music-drama group on the empirical scale, we have :

$$S_i = .725 + \left(\frac{.500 - .477}{.300} \right) .697 = .779$$

In cases where 50% of the judgements made by a subject fell in the first interval (0-1) or the last interval (3-4) a scoring adaptation procedure had to be employed. The method is described by Edwards in Techniques of Attitude Scale Construction (p.130 f). The adaptation for lower limit scores was used often when scoring subjects on the authoritarian scale. This resulted in the derivation of a constant figure

$$\text{Constant} = .363$$

The constant had to be added to the scores of all subjects on all scales, other than the lower limit scores. For example, the scale value for subject #3 of the Music-drama group became :

$$.779 + .363 = 1.142$$

The scale values for this subject and all other subjects on the four scales are included in Appendix C.

The Correlation Coefficient

As mentioned earlier we are interested in the possible relationship between A.R.O. scores and Scale Values. The two scores for all subjects on the empirical scale were therefore correlated by a raw-score formula as set out by Allen Edwards (7, p.73) $r = .830$

This correlation coefficient indicates a definite positive relationship between the two sets of scores. It is significant at the .01 level.

Although the intuitive, rational and authoritarian scale scores were not included in this correlation, all 183 sets of empirical scale scores were. The range of scores, both A.R.O. and Scale Value scores in the other scales were similar to those of the empirical scale. Correlation scatter plots done from subject scores on the intuitive, rational, and authoritarian scales indicate (by inspection) an $r = .85$ or better for each of these scales (Appendix D).

On the assumption that these findings are typical of future sampling it is concluded that the A.R.O. method of scoring may be used in scoring results of the P.E.P.

CHAPTER IV

TEST VALIDITY AND RELIABILITY

External Validation

In the chapter on test revision and administration, the four subgroups which composed the total sample for this research were defined. The cognitive characteristics of these groups are known quite well from common experience.

It may be said that individuals in the Chem-biology group must be keenly interested in experimentation and observation and therefore should score higher on the empirical scale of the inventory than subjects in the Math-physics, Music-drama, or Military groups. The Math-physics subjects should be highest on the rational scale, since logic and reason are the mental tools these people use most. We also postulated that the Music-drama group will be high on the intuitive scale, and the Military group on the authoritarian scale. Differences among groups on the various scales were therefore sought as indications of validity or non-validity.

The two tailed "t test" of significance was employed as a measure of test validity. Before presenting the t's themselves let us look at the group means and standard deviations.

TABLE V

GROUP MEANS AND STANDARD DEVIATIONS

ON

EMPIRICAL, INTUITIVE, RATIONAL AND AUTHORITARIAN SCALES.

Empirical Sc.			Intuitive Sc.		Rational Sc.		Authorit.Sc.	
Groups	M	σ	M	σ	M	σ	M	σ
Chem.Bio N.48	* 1.223	.167	1.141	.200	1.337	.192	.516	.192
Mu-Drama N.50	1.102	.160	* 1.489	.197	1.203	.170	.606	.223
Math-Phy N.44	1.162	.184	1.142	.219	* 1.452	.166	.504	.179
Military N.41	1.160	.150	1.092	.161	1.423	.164	* .639	.200

You will note from Table IV, when moving vertically across groups on each of the scales, that as expected the Chem-biology group has a higher mean on the empirical scale than the other groups; the Music-drama group has the highest mean on the intuitive scale; Math-physics are high on the rational scale; and the Military has the highest mean on the authoritarian scale.

When moving horizontally by group across the four scales, the picture changes somewhat. A within group comparison for the Music-drama and Math-physics groups proves as ideal as the across group comparison. Music-drama people score higher on the intuitive scale than on the other three scales, and Math-physics people are higher on the rational scale than on the other three. This does not hold however, for the Chem-biology group or the Military. Both these groups have a higher mean on the rational scale than on any other.

The within group comparison of scales does not really concern us as far as normative validity is concerned, but the above mentioned ipsative inconsistency is worthy of note and will be given further comment later.

The standard deviation figures indicate that the Chemistry scores deviate less on the empirical scale than on the other scales. The scores for this group on the empirical scale were consistently high.

The range of the Music-drama scores were greater on the intuitive scale than on the empirical and rational scales, but the greater range was upward from the mean. All the subjects scored well on the intuitive scale and a few of the scores were extremely high.

The Math-physics group were most consistent on the rational scale and the Military least consistent on the authoritarian scale. The scores of the Military people on the authoritarian scale varied from very low to very high.

The four groups were compared with each other on each of the four scales (twenty-four comparisons) and the following t 's resulted :

TABLE VI
GROUPS COMPARED ON THE EMPIRICAL SCALE
AND
RESULTING t VALUES

	Chem-Biology	Music-drama	Math-Physics	Military
Chem-Biology				
Music-drama	** 3.56			
Math-Physics	* 1.85	* 1.81		
Military	* 1.90	* 1.75	.06	

The direction significance will be indicated by the order in which the groups are named. The direction will be in favor of the first group mentioned.

- ** Chem-biology - Music-drama = .01 level of significance
- * Chem-biology - Math-physics = .05 level of significance
- * Chem-biology - Military = .05 level of significance
- * Math-physics - Music-drama = .05 level of significance
- * Military - Music-drama = .05 level of significance

TABLE VII
GROUPS COMPARED ON THE INTUITIVE SCALE
AND
RESULTING t VALUES

	Music-Drama	Chem-biology	Math-Physics	Military
Music-drama				
Chem-biology	**7.90			
Math-physics	**8.26	.02		
Military	**9.45	1.58	1.25	

The direction of significance will again be and hereafter in favor of the first group mentioned.

- ** Music-drama - Chem-biology = .01 level of significance
 ** Music-drama - Math-physics = .01 level of significance
 ** Music-drama - Military = .01 level of significance

TABLE VIII
 GROUPS COMPARED ON THE RATIONAL SCALE
 AND
 RESULTING t VALUES

	Math-Physics	Chem-biology	Music-drama	Military
Math-Physics				
Chem-Biology	** 3.48			
Music-drama	** 7.54	** 4.06		
Military	.85	* 2.60	** 6.11	

- ** Math-physics - Chem-biology = .01 level of significance
 ** Math-physics - Music-drama = .01 level of significance
 ** Chem-biology - Music-drama = .01 level of significance
 * Military - Chem-biology = .05 level of significance
 ** Military - Music-drama = .01 level of significance

TABLE IX
 GROUPS COMPARED ON THE AUTHORITARIAN SCALE
 AND
 RESULTING t VALUES

	Military	Chem-biology	Music-drama	Math-physics
Military				
Chem-biology	** 3.07			
Music-drama	.78	* 2.50		
Math-physics	* 2.35	.77	* 1.67	

** Military - Chem-biology	=	.01 level of significance
* Military - Math-physics	=	.05 level of significance
* Music-drama-Chem-biology	=	.05 level of significance
* Music-drama-Math-physics	=	.05 level of significance

The results set out in Tables VI, VII, VIII and IX show that empiricism is a more dominant cognitive characteristic in the Chem-biology group than in any other; intuitionism is much stronger among Music-drama people than it is elsewhere; rationalism reigns more supreme in the Math-physics group than the Chem-biology or Music-drama groups; and the authoritarian way of knowing is employed significantly more often among the Military than by scientists or mathematicians. It is evident that the P.E.P. has separated out the four ways of knowing in a non-chance fashion and appears to be a valid instrument of measure on those characteristics for which it was designed. Though the results are not "perfect", they are substantial and most encouraging.

Having said this, there are certain qualifications or points of elaboration required. First of all, with regard to the Chem-biology group, when comparing this group with the other three on the empirical scale we see from Table V a significant difference to the .01 level over the Music-drama group and to the .05 level over Math-physics and the Military groups. However, the highest mean for this group (Table V), is seen to be the rational scale mean. The explanation for this, I think, rests in the nature of the population. Though this group is committed to an

empirical cognitive style, all its members are post graduate university students. The university demands logic and reason of all students, so its appearance in this fashion is not suprising. The majority of those in the Military group are also university people. On the other hand, in the Music-drama group, where the subjects are mostly "off campus" people, rationalism appears a less important way of knowing. The rational scale mean of the Music- drama group is the lowest of the four groups.

Comment must be made too about the quality of the subgroup people. We did not expect to find a group of subjects purely empirical, intuitive, rational, or authoritarian in cognitive style, but it would appear that the Military group is weakest in this respect. Table IX indicates that the Music-drama subjects are almost as authoritarian as those of the Military; at least there is no significant difference. Table IV reveals an even more disturbing factor. While the Military has a higher authoritarian scale mean than the other three groups, it is the lowest scale mean for the Military group itself. Though the Military have the authoritarian dominance, and significantly so the scores for this group on the authoritarian scale were low. Such could mean that the Military is not the best possible group we could have used for the validation study, or that authoritarianism is never the most dominant characteristic of any group of people regardless of life situation or career pursuit. I prefer to believe the former. In fact it is quite likely the former, for authoritarianism is difficult to disguise in item form and there is a definite social stigma associated with this mental mode in our day.

The Music-drama group results and those of Math-physics are of the kind hoped for and perhaps could be obtained on the empirical and authoritarian scales through better subject selection and item composition. The Music-drama people attained the highest mean on the intuitive scale and show a significant dominance to the .01 level over the three other groups on this scale. The Math-physics groups responded extremely well to the rational items of the inventory and by comparison with groups other than the Military, prove a non-chance relationship. It must be noted that rationalism has a dominance in all groups tested and this is not surprising. Reason is the big ethos of a university population.

The other relationships pointed up in the tables of t are not surprising. Math-physics people and the Military are significantly stronger on the empirical scale (Table VI) than the Music-drama group. One would expect this as military men and physicists look out on the world and "observe", while the artist looks inward and "listens".

The rational scale (Table VIII) places the Military significantly ahead of Chem-biology at the .05 level to the .01 level over Music-drama. The chemistry students, who composed the greater part of this subgroup, were all experimentalists and apparently not as theoretical or analytical mentally as the army subjects. It would seem too, that while the artist "dreams" the army officer "reasons".

The authoritarian scale results (Table IX) indicate that artists not only "dream", but as well "believe". An artist does not have to be "shown" as does a scientist, or have it "proven" as the mathematician.

The Reliability Study

Test - Retest

After a period of three months thirty-six of the original subjects (Chem-biology - 20, Math-physics - 10, Music-drama - 6) rewrote the P.E.P. The Military group could not be retested because of a time and situation problem, and the retest sample as a whole was small, for these and other reasons.

The retest protocols obtained were scored by the method of successive intervals, as all statistical work was done using scale values, and the scores compared with those of the first testing. The following correlation coefficients were obtained:

Empirical scale	:	$r = .81$
Intuitive scale	:	$r = .46$
Rational scale	:	$r = .54$
Authoritarian scale:		$r = .75$

The same raw-score formula was used to attain the above correlation coefficients as was used in comparing A.R.O. scores and scale values (Edwards, 1958, p. 73).

The test reliability of the P.E.P. would appear to be low from these results, but nonetheless some encouragement is given.

The empirical scale coefficient is closest to the $r = .90$ minimum and please note that Chem-biology people composed better than 50% of the retest group. Had the N (number) been greater in the other subgroups, the coefficient on the respective scales would likely have been higher.

The correlation coefficient for the authoritarian scale is higher than that of the intuitive or rational scale, but most likely this is because all subject scores were consistently low on this scale.

A positive relationship does exist between first and second testing on each of the four scales. This being the case it is reasonable to hope for better results with a larger and more representative retest group. As well, there is no doubt but that reliability will be positively affected as item quality is improved. It is expected that an item analysis will be done to this end.

CHAPTER V

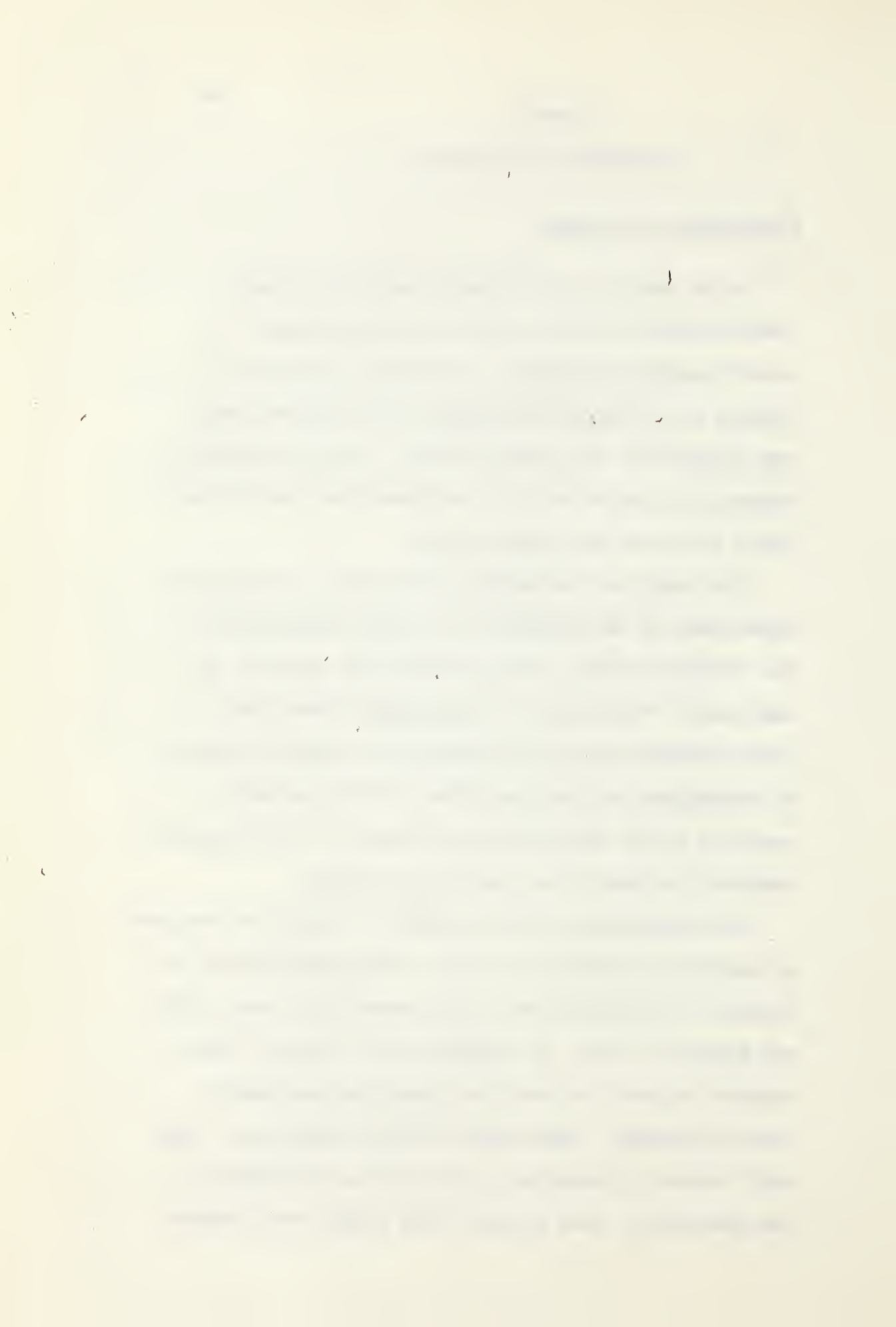
LIMITATIONS OF THE STUDY

Homogeneity of the Sample

In the course of this research one of the primary considerations in subject selection, was commitment to a specific academic discipline. By choosing subjects in certain, as it were, epistemological ruts, criterion groups were obtained for the validity study. It must be admitted, however, that the subjects of the Chem-biology and Military groups could have been improved upon.

The results of the validity study show a .01 level of significance in the direction of the Music-drama group on the intuitive scale, over the other three groups on the same scale. This result is theoretically "ideal", and since achieved in one of the categories of the study, might be accomplished for the other three. To do this would require a further purification particularly in those subjects composing the Chem-biology and Military groups.

The Chem-biology subjects displayed an empirical dominance as expected, but were also strong on the rational scale. All subjects of this group were taking theoretical courses which may account for this. To eliminate this "rational" contamination subjects not receiving theoretical instruction could be employed. Even greater efforts to sample the "cook book" variety of scientist, such as the lab technician, is one possibility. Such subjects would likely show a greater



differential between the empirical and rational scores obtained by the group as a whole.

In this same vein, it can be argued that Army officers were not the best possible subjects for the authoritarian group. It is true that a soldier must carry out orders without question, but as well, the officer must think astutely. Though the military group were significantly higher on the authoritarian scale than the Chem-biology and Math-physics groups, its own authoritarian scale mean was lower than its own mean on the other three scales. We considered a fundamentalist religious group for this sample, but discarded the idea because of the problem of differential educational level.

Part of the difficulty encountered in the choice of contrasting groups was brought about by the attempt to find subjects for all groups with the same level of education. A similar level of education was sought in all subjects for two reasons. Firstly, so that the criterion groups would be composed by those well into a particular program of training and hence epistemologically committed and conditioned. Secondly, the advanced nature of the vocabulary used in the inventory made it an important consideration. The fear was that those without advanced education might misunderstand the meaning of many of the items composing the inventory. The second consideration may not be as problematic as first thought, since many of the Music-drama subjects, were not university trained, and had no difficulty in answering the inventory.

It must be noted too, that social, economic, and ethnic factors were essentially uncontrolled in this study and their possible effects were not explicitly investigated.

Validity

An a priori determined scheme based on the theory behind the P.E.P. was employed for validation purposes. Subjects whose cognitive characteristics were indicated from observation as rational, empirical, intuitive and authoritarian were chosen for the criterion groups. The test of validity was based on the ability of the several scales to differentiate between the criterion groups. Though this approach is circular in a sense, it was the only way open to us at this stage of the inventory's development, and the results indicate some empirical validity.

Validity of other kinds, however, could be sought to improve the value of the P.E.P. An item analysis could be undertaken. Twice as many items as will be required on the final form of the scale were included in the administration in anticipation of this step. The general quality of the items will be improved upon by an item analysis, and both reliability and validity positively affected.

Concurrent validity would also strengthen the position of the P.E.P. A group of subjects could be given the P.E.P., The Myers-Briggs Type Indicator, The Gray-Wheelwright Psychological Type Questionnaire, The California F Scale, and appropriate comparisons made.

As an additional step a factorial analysis of the inventory could be undertaken as a check on the unidimensionality of each of the scales.

Reliability

The reliability study done in the course of this research requires further consideration. The size of the retest sample was small; only thirty-six subjects in all took the inventory a second time. Also, the retest sample was not completely representative of the original group. Most of the subjects composing the retest group were Chem-biology and Math-physics subjects. For the most part Music-drama and Military people were not retested. Reliability is likely to be increased as a function of increased variability in the sample.

More standardization in the test administration might also be of value. Problems of timing and circumstances made it necessary to administer the inventory under three differing conditions. Some subjects took the inventory in a group situation with verbal instructions, others received it in the mail with a covering letter, and still others wrote it at home after receiving a verbal orientation. All subjects wrote the inventory at one sitting. While the quality of performance did not appear to be affected by such differences of administration, reliability may be improved upon by a thoroughgoing standardization in test administration procedure.

A shortened inventory of improved quality would likely have a positive affect also. We suspect that fatigue factors and

some loss of interest may have come into play since the inventory in its present form requires one hour and a half to complete.

Other methods of assessing reliability could also be undertaken. The split-half technique is one which could be employed immediately. Scores on the odd and even numbered items could be correlated. The Kuder-Richardson formula could be employed as a test of item homogeneity. A parallel form of the inventory might also be written and subjects' scores on the two forms correlated.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The P.E.P., its revision, scoring, validity and reliability, has been a thesis with a fivefold purpose.

1. An attempt was made in the first chapter to point up theories of psychological function which lend support to the thinking of Joseph Royce in The Encapsulated Man. It is Royce's conviction that man, in his search for meaning, behaves psycho-epistemologically in particular ways. Man has the faith that certain thoroughfares are more dependable and will lead him to the truth more directly than will alternate routes. There are four main avenues to knowledge open to man - reason, observation, intuition, and belief. Some men prefer the road of reason and ride it more frequently than any other; others choose the "outer" lane of observation most often; others travel the "inner" lane of intuition; and still others go by way of belief. All men seek meaning and truth, but they do not all find it via the same route.

The fully functioning individual is not encapsulated by any one of these ways of knowing; he is not rut-bound by rationalism, intuitionism, empiricism, or authoritarianism, but moves freely from one road to the other as the situation and circumstances demand it. The encapsulated man is a slave to logic, his senses, his feelings, or a certain ideology. Whereas he should be the master and his mind the servant, instead a particular cognitive structure comes to dictate the policy for the whole of his life.

This, of course, is the extreme. Within the mental life of the average man the ways of knowing are arranged in a hierarchical fashion; all are employed but in a definite preference order.

It was discovered from a review of related literature that other theorists conceptualize concerning reason, intuition, empiricism, and authoritarianism, and this in itself lends support to the thought patterns of Joseph Royce. However, the writer was unable to find theories which divided the cognitive whole in the same manner as Royce. Also, though related, other theories stress cognitive content and attitude rather than its structure and function.

2. Theories are fine, but if a theory is to stand it must be able to survive the test of time and scientific scrutiny. Believing that the "epistemological profile" has merit, steps were taken to put it to the test. An inventory, The Psycho-epistemological Profile, was constructed and administered to one hundred and eighty-three subjects. Most of these people were post graduate university students and discussed both the inventory and theory behind it intelligently and with interest. This was done of course after the inventory had been written for the second time so that their responses would not be influenced before the reliability study was complete. Most reacted favorably to the test, and said they thought the inventory reflected those aspects of mind purported in the theory. Encouragement of this kind has been received from other quarters too, so it is our reinforced faith that the P.E.P. does measure the dominance of the ways of knowing for individual men.

The majority of the one hundred and one items of the inventory were completed by most of the subjects; most were well motivated and there was no apparent confusion over test items or instructions.

3. The one hundred and eighty-three subjects who took the P.E.P. were scored according to their responses to the empirical, intuitive, rational and authoritarian alternatives under each item. The frequencies of first, second, third, and fourth choices were treated on an "average rank order" basis and by the "method of successive intervals". The two resulting scores were compared and a very definite relationship found. The correlation coefficient was $r = .83$ (raw-score formula).

The conclusion this result dictates is that the A.R.O. scoring procedure is an adequate method for the P.E.P. The method of successive intervals is a more refined scoring technique and is more precise at the upper and lower ends of the scale. However, the occurrence of high and low scores is not frequent enough to demand that the method be employed.

4. The P.E.P. was found to be a valid instrument of measurement on its four scales by comparing the scores of four subgroups of known characteristics with each other (t tests of significance).

On the empirical scale the Chem-biology students' scores were significantly higher than the Music-drama, Math-physics and Military group scores to the .01, .05, and .05 levels.

On the intuitive scale the direction of significance favored the Music-drama group over the other three to the .01 level.

The Math-physics group scores were highest on the rational scale in a non-chance fashion; to the .01 level over Chem-biology and Music-drama.

The Military group also scored well on the rational scale, yet on the authoritarian scale the Military scores were much higher than those of the Math-physics group - .05 level of significance. There was no significant difference between the scores of the Military and Music-drama people on the authoritarian scale, but a .01 level of significance was found when comparing the Military and Chem-biology groups.

The P.E.P. separated out the ways of knowing clearly and in a non-chance fashion. The evidence suggests however, that the subjects in the military group particularly and in the Chem-biology group, could have been improved upon for validation purposes.

5. Retest reliability for the P.E.P. rendered low correlation coefficients.

E	scale : $r = .81$
I	scale : $r = .46$
R	scale : $r = .54$
A	scale : $r = .75$

These results are nonetheless encouraging, since the size of the retest sample was small and also, since it is anticipated that reliability will improve as item quality is improved. An item analysis will be done to this end.

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APPENDIX A.

UNIVERSITY OF ALBERTA

PSYCHOLOGICAL INVENTORY

University of Alberta Psychological Inventory

Revised Experimental

FORM I

Directions

Each of the following situations or questions is followed by four possible attitudes or answers. Arrange these answers in the order of your personal preference by writing, in the appropriate box on the answer sheet, a score of 1, 2, 3, or 4. Proceed as follows: for the alternative you prefer most write 1 under the letter standing for that alternative on the answer sheet. For example, if answer b most appeals to you, write 1 under b on the answer sheet.

Next choose the answer that you least prefer, and write 4 under the appropriate letter. At this point, there are two answers left which you have not rank-ordered. Do this as follows: of these two, choose the answer you most prefer, and write 2 under the proper letter on the answer sheet. And, of course, the alternative remaining should be filled in with 3, for it represents your third choice in order of preference. Here is a sample question:

My favorite color is:

(a) blue

(b) chartreuse

(c) red

a b c d

(d) green

3 4 2 1

In this example since the person's favorite color is green, he writes 1 under answer d. His least favorite color is chartreuse, answer b. Of the two left, he chose red as his preference, writing 2 under c. And blue, answer a, became his third choice, number 3.

It should be kept in mind that there are no right or wrong answers, your preferences alone being required, and in fact, you may think of answers which would be preferable from your point of view to any of those listed. It is necessary, however, that you make your selection from the alternatives presented, and arrange all four in order of their desirability, guessing when your preferences are not distinct. If you find it impossible to state your preference, or you don't understand any or all of a particular question, you may omit it. Be sure not to assign more than one 1, one 2, et cetera, for each question. There is no time limit.

1. Other things being equal, I would rather be a:
 - a. Geologist
 - b. Philosopher
 - c. Psychiatrist
 - d. Priest
2. The important qualification for a quarterback in football is that he:
 - a. be able to reason quickly and well
 - b. be a master of the time tested fundamentals of the game
 - c. be endowed with a special football sense
 - d. be keen of eye and touch
3. Which of the following is the best reason for believing in God?
 - a. we are able to observe the results of His handiwork in nature
 - b. we are told in the Bible of His nature and the reality of His love
 - c. we are often inwardly aware of His presence
 - d. we know that only God could have created man's capacity for reason
4. When reading an historical novel, I am most interested in:
 - a. the author's interpretation of the historical situation
 - b. the factual accuracy found in the novel
 - c. the logical unraveling of seemingly contradictory evidence
 - d. the subtleties of the personalities described
5. Life and understanding has been furthered most by:
 - a. mathematics
 - b. time-honored traditions
 - c. art and literature
 - d. biology
6. Russian Communism may be destined to failure because:
 - a. it limits the creativeness of its people
 - b. it withholds observable world trends from its people
 - c. it is a somewhat vague and incoherent system
 - d. it has not followed the principles of its founder, Karl Marx
7. The greatest contribution to mankind can be made by:
 - a. creative ingenuity
 - b. impartial observation
 - c. historical analysis
 - d. sound reasoning
8. A principle of conduct is real for me when it is:
 - a. given me by way of an inner sense
 - b. accepted by men of authority
 - c. logically coherent
 - d. in accord with what I see and hear

9. The best single criterion of the truth of a statement is that it is:
- a. based on valid assumptions
 - b. supported by observable evidence
 - c. consistent within itself
 - d. acceptable to the experts
10. A newly independent country will achieve world recognition as it:
- a. promotes scientific education among the people.
 - b. thinks through a workable plan for national development
 - c. seeks to develop leaders with "vision"
 - d. follows the lead of older, more experienced nations
11. In choosing a job I would look for one which offered:
- a. the opportunity to use imaginative ideas
 - b. a good average wage with many fringe benefits
 - c. a specific intellectual challenge
 - d. opportunity for experimentation and observation
12. When buying new clothes, I look for:
- a. uniqueness of design
 - b. style
 - c. general "eye appeal"
 - d. economy
13. A good teacher is primarily one who:
- a. is a sound disciplinarian
 - b. helps his students to develop their powers of reason
 - c. is sensitive to the needs of the students
 - d. is highly objective in his approach to the students and material taught
14. I am attracted most to people who are:
- a. dependable
 - b. conventional
 - c. realistic
 - d. spontaneous
15. Of the following, the book with the most appeal for me would be:
- a. The Logic of Scientific Discovery
 - b. The Creative Process of Science
 - c. Tactics of Scientific Research
 - d. A Short History of Science
16. My intellect has been developed most by:
- a. abstract theoretical knowledge
 - b. insightful self knowledge
 - c. factual sense knowledge
 - d. testimonially given knowledge

17. I would rather
- a. Newton
 - b. Shakespeare
 - c. St. Paul
 - d. Darwin
18. A meaningful religious concept must be supported by:
- a. reason
 - b. denominational doctrine
 - c. relevant natural phenomena
 - d. a personal awareness of its truth
19. The main reason for atheism is:
- a. rebellion against authority
 - b. the presence of paradox in theological thought
 - c. the fact that the spiritual realm does not lend itself easily to experimentation
 - d. the absence of a religious experience in the lives of many
20. My children must possess this characteristic:
- a. obedience
 - b. sensitivity
 - c. consistency of thought
 - d. awareness of nature
21. Education in our high schools should place a greater emphasis on:
- a. mathematics and logic
 - b. fine arts and literature
 - c. history and government
 - d. natural science
22. "The proof of the pudding is in the eating." What is my reaction?
- a. this is the only way to find out
 - b. it's true because the majority of people would agree
 - c. yes, but isn't there more to life than just "the tasting"?
 - d. it is a reasonable idea
23. A nation's foreign policy will be weak where:
- a. sympathetic understanding of all countries of the world is lacking
 - b. decisions are made hastily without sufficient deliberation
 - c. tradition is sacrificed in the interest of present world trends
 - d. the government in power ignores pending economic conditions in the interests of re-election

26. The best evidence that man has freedom of choice is:

- a. the assent given to it by great men
- b. the assent given to it by one's own process of thought
- c. the dictates of the human heart
- d. the lack of uniformity in the social behavior of man

27. Human morality is molded primarily by:

- a. long standing moral precepts
- b. the behavior of the majority
- c. attitudes unconsciously imparted to children by their parents
- d. individual assessment of what is right or wrong

28. Shakespeare was a great playwright because he:

- a. possessed mental agility and thoughtful ability
- b. could plumb the depths of the human soul to gain insight into life and art
- c. knew the rules of language and careful expression
- d. was able to "stand outside" the daily round of human existence and see man as he rarely sees himself

29. The most valuable person on a scientific research team is one who:

- a. has true powers of imagination
- b. has a good knowledge of important related research
- c. is a careful observer and classifier
- d. is gifted at critical analysis

30. When people are arguing a question from two different points of view, I would say that:

- a. the argument is pointless, and can only be resolved by actual observation of the debated situation
- b. a third person's opinion is needed, who both parties respect
- c. thoughtful reexamination of the logical consistency of each argument is needed
- d. each should endeavor to assess honestly his own attitude and bias before arguing further

31. The analysis of dreams is sometimes a fruitful clinical approach because:

- a. dreams are often the representation of some previous and important incident
- b. repressed feelings may be given expression
- c. dreams may be an attempt to solve a problem which has stumped the dreamer
- d. astute observations made by the dreamer, but captured by the subconscious, may come to the surface

30. I enjoy most listening to a lecturer who
- develops his topic according to a well-planned outline
 - has a sparkling entertaining delivery
 - talks without notes and is responsive to the leanings of his audience
 - follows the accepted and proven rules of lecturing
31. If I were to buy a new house I should want
- a suitably laid out garden
 - the architecture to have an overall appeal
 - the house to be built by a contractor with "a name"
 - the house built to an intrinsically different design
32. To while away leisure hours, I would rather:
- read an autobiography
 - see a documentary film
 - play chess or bridge
 - read an excellent novel
33. I would be most at home in a sub-culture:
- traditions are faithfully lived up to
 - the expression of creative talent is encouraged
 - realism and objectivity are highly valued
 - people can freely discuss their philosophy of life
34. If I am in a contest, I try to win by:
- trying out new ways to score
 - following the advice of experts
 - keeping my eyes and ears alert
 - applying my cunning to make and take advantage of breaks
35. I would rather have written:
- Principia Mathematica
 - The Origin of Species
 - Hamlet
 - The Magna Carta
36. Given unlimited time, in choosing between two alternative investment possibilities, I would:
- depend upon the tips of a reliable broker
 - try to get an overall picture of the growth potential of each possibility
 - keep a close watch on their fluctuation in the stock exchange
 - put my faith in a strong hunch

37. Germany's decision to go to war in 1939 was questionable because:
- her military ambitions were obviously unrealistic
 - her strategy was not well enough foreplanned
 - she lacked insight into the international dynamics of the time
 - she ignored the advice of many who were experienced military men
38. To be a success a person should:
- follow a proven trade or profession
 - create new ways for better living
 - think through what constitutes a good life
 - be a careful observer of the facts of existence
39. I am most attracted to people who:
- always keep their feet on the ground
 - have a resourcefulness of personality
 - thoughtfully evaluate their convictions
 - are loyal to family and country
40. Of the following the subject I would most like to study is:
- theology
 - biology
 - calculus
 - art
41. When faced with a difficult problem I usually:
- seek help from people with experience in the problem area
 - make use of the available evidence to extricate myself
 - wait for an inner guidance and direction
 - think the problem through carefully before acting
42. To prove a thesis false, we must show that:
- authorities on the subject disagree with it
 - the facts contradict it
 - it is illogical
 - it has minimal significance
43. I like to think of myself as:
- observant
 - thrilling
 - respectable
 - consistent
44. Many T.V. programs:
- fail to "meet the mind" of the viewer
 - are simply uninspired
 - ignore traditional standards of decency
 - are based on inadequate background research

45. Many people enjoy gambling because:
- a. the element of chance makes it exciting
 - b. there is a certain prestige afforded a sinner
 - c. "a system" may sometimes be derived which works
 - d. it gives the careful observer a chance to apply his talent.
46. The backward countries of the world are most often those where illiteracy prevails. This is so because:
- a. ignorant people, without question usually, do as they are told to do by the powers that be
 - b. an understanding of technology and its advantages are hidden from those who are not able to read
 - c. the written word unlocks the door of self-knowledge
 - d. ideas are the womb of analytical thought
47. People who most enjoy the opera are those who:
- a. appreciate the imaginativeness of great music
 - b. are familiar with the idea which was present in the mind of the composer.
 - c. are aware of the principles of harmony and counterpoint
 - d. appreciate the technical and physical skills of the performance
48. A good indicator of decay in a nation is:
- a. increased immoral behavior among the people
 - b. a decline of interest in the arts
 - c. a decline in industrial development
 - d. an increase in the sale of movie magazines over news publications
49. Evolution vs. Creation is not "the issue" today that it was many years ago because:
- a. additional analysis of the scriptures has reduced the apparent conflict.
 - b. the Bible is no longer proclaimed to be a scientific text book. It is the record of man's spiritual experience
 - c. both science and religion assume an essential goodness in creation
 - d. "men of science" and "men of religion" have a mutual concern for the welfare of mankind
50. The prime function of a university is to:
- a. develop a sensitivity to life
 - b. train the minds of the capable
 - c. teach the principles of research and discovery
 - d. impart the wisdom of the ages

51. Happiness is fostered most by the attitude of:
- a. patience
 - b. persistence
 - c. penitence
 - d. impartiality
52. When visiting a new locality I first of all:
- a. capture the scenery on film
 - b. pause to be moved by its scenic beauty
 - c. seek out a museum to learn of its people and tradition
 - d. plan a course of action to guide my visit
53. Modern business has been instrumental in the promotion of:
- a. trade
 - b. tradition
 - c. invention
 - d. welfare
54. The kind of reading which interests me most is that which:
- a. stimulates critical thought
 - b. is symbolic in nature - creating new insight
 - c. is recognized as classic
 - d. is essentially true to life
55. The most important criterion for judging a debate is the:
- a. apt use of illustrations from life
 - b. use of relevant quotations
 - c. systematic development of sound argument
 - d. imaginativeness of interpretation
56. Upon election to parliament I would endorse:
- a. the preservation of historical sites
 - b. the development of potential hydro-power
 - c. monthly telecasts presenting political and governmental information
 - d. steps to encourage an interest in the arts
57. Polygamy is an undesirable practice because:
- a. it does not foster wholesome family life or child development
 - b. women, by nature of this arrangement, are less than equal to men
 - c. a true "love relationship" is not possible under these circumstances
 - d. it does not encourage men to rise above his animal nature
58. Who has contributed most to mankind:
- a. Louis Pasteur
 - b. Martin Luther
 - c. Goethe
 - d. Einstein

the following are the results of the survey

- 1. The first group of results shows that the majority of the respondents are male, with a ratio of approximately 70% to 30%.
- 2. The second group of results shows that the majority of the respondents are aged between 25 and 35, with a ratio of approximately 60% to 40%.
- 3. The third group of results shows that the majority of the respondents are employed, with a ratio of approximately 80% to 20%.
- 4. The fourth group of results shows that the majority of the respondents are married, with a ratio of approximately 70% to 30%.

These results are consistent with the findings of previous studies.

- 5. The fifth group of results shows that the majority of the respondents are satisfied with their current situation, with a ratio of approximately 60% to 40%.
- 6. The sixth group of results shows that the majority of the respondents are planning to stay in their current location, with a ratio of approximately 70% to 30%.
- 7. The seventh group of results shows that the majority of the respondents are planning to continue their education, with a ratio of approximately 80% to 20%.
- 8. The eighth group of results shows that the majority of the respondents are planning to start a family, with a ratio of approximately 90% to 10%.

These results are consistent with the findings of previous studies.

- 9. The ninth group of results shows that the majority of the respondents are planning to move to a new location, with a ratio of approximately 30% to 70%.
- 10. The tenth group of results shows that the majority of the respondents are planning to change their career, with a ratio of approximately 40% to 60%.
- 11. The eleventh group of results shows that the majority of the respondents are planning to change their lifestyle, with a ratio of approximately 50% to 50%.
- 12. The twelfth group of results shows that the majority of the respondents are planning to change their values, with a ratio of approximately 60% to 40%.

These results are consistent with the findings of previous studies.

- 13. The thirteenth group of results shows that the majority of the respondents are planning to change their beliefs, with a ratio of approximately 70% to 30%.
- 14. The fourteenth group of results shows that the majority of the respondents are planning to change their attitudes, with a ratio of approximately 80% to 20%.
- 15. The fifteenth group of results shows that the majority of the respondents are planning to change their behaviors, with a ratio of approximately 90% to 10%.
- 16. The sixteenth group of results shows that the majority of the respondents are planning to change their emotions, with a ratio of approximately 100% to 0%.

These results are consistent with the findings of previous studies.

- 17. The seventeenth group of results shows that the majority of the respondents are planning to change their personality, with a ratio of approximately 100% to 0%.
- 18. The eighteenth group of results shows that the majority of the respondents are planning to change their identity, with a ratio of approximately 100% to 0%.
- 19. The nineteenth group of results shows that the majority of the respondents are planning to change their destiny, with a ratio of approximately 100% to 0%.
- 20. The twentieth group of results shows that the majority of the respondents are planning to change their fate, with a ratio of approximately 100% to 0%.

These results are consistent with the findings of previous studies.

- 21. The twenty-first group of results shows that the majority of the respondents are planning to change their life, with a ratio of approximately 100% to 0%.
- 22. The twenty-second group of results shows that the majority of the respondents are planning to change their world, with a ratio of approximately 100% to 0%.
- 23. The twenty-third group of results shows that the majority of the respondents are planning to change their universe, with a ratio of approximately 100% to 0%.
- 24. The twenty-fourth group of results shows that the majority of the respondents are planning to change their everything, with a ratio of approximately 100% to 0%.

These results are consistent with the findings of previous studies.

- 25. The twenty-fifth group of results shows that the majority of the respondents are planning to change their nothing, with a ratio of approximately 100% to 0%.
- 26. The twenty-sixth group of results shows that the majority of the respondents are planning to change their someone, with a ratio of approximately 100% to 0%.
- 27. The twenty-seventh group of results shows that the majority of the respondents are planning to change their anything, with a ratio of approximately 100% to 0%.
- 28. The twenty-eighth group of results shows that the majority of the respondents are planning to change their everywhere, with a ratio of approximately 100% to 0%.
- 29. The twenty-ninth group of results shows that the majority of the respondents are planning to change their anytime, with a ratio of approximately 100% to 0%.
- 30. The thirtieth group of results shows that the majority of the respondents are planning to change their anyone, with a ratio of approximately 100% to 0%.

These results are consistent with the findings of previous studies.

- 31. The thirty-first group of results shows that the majority of the respondents are planning to change their everything, with a ratio of approximately 100% to 0%.
- 32. The thirty-second group of results shows that the majority of the respondents are planning to change their everywhere, with a ratio of approximately 100% to 0%.
- 33. The thirty-third group of results shows that the majority of the respondents are planning to change their anytime, with a ratio of approximately 100% to 0%.
- 34. The thirty-fourth group of results shows that the majority of the respondents are planning to change their anyone, with a ratio of approximately 100% to 0%.
- 35. The thirty-fifth group of results shows that the majority of the respondents are planning to change their anything, with a ratio of approximately 100% to 0%.

59. I would prefer to visit:

- a. a library
- b. a museum
- c. a botanical garden or zoo
- d. an art gallery

60. The most effective leaders are those who:

- a. are able to formulate and communicate plans
- b. have a warmth of personality
- c. are well mannered and familiar with protocol
- d. miss little of what goes on around them and take advantage of every opportunity

61. The church should place a greater emphasis on the:

- a. logical consistency of church doctrine
- b. reading of the scripture
- c. observance of Holy Communion
- d. presentation of personal testimony

62. When reading the newspaper I spend most of my time on the:

- a. editorial page
- b. personal counsel section
- c. front page
- d. sports page

63. To take the worry out of the present world crisis we should:

- a. accept the thesis that history is likely to repeat itself
- b. give our support to "Research for Peace" organizations
- c. surpass the Russians in atomic and space research
- d. try to increase our sympathetic understanding of the motivations of our antagonist

64. Hockey is a great game because:

- a. the mechanics of the game are absorbing
- b. seeing the race of the colorful players is a thrill
- c. it is Canada's national sport
- d. of the intense human emotions frequently displayed

65. When I get depressed, it is usually because I have:

- a. been disappointed by a loved one
- b. been rebuked by someone more important than myself
- c. overlooked some important detail which should have been obvious
- d. allowed emotion to determine my action instead of using my head

66. My parents would have been better parents if they had:

- a. been more consistent in their ideas and actions
- b. been more familiar with new trends in child psychology
- c. taken more time to "get to know" their children
- d. taken more seriously the old adage, "spare the rod and spoil the child"

67. Any utopian idea is likely to fail because:
- a. theory does not always work out in practice
 - b. such ideas have met with little success in the past
 - c. the needs of the individual differ from those of the masses
 - d. they are frequently not well thought out
68. The domineering individual of a group soon becomes apparent because:
- a. he usually tries to impose his authority
 - b. in his desire to dominate he may support ideas which are incompatible
 - c. he is usually unaware when he has injured someone's feelings
 - d. he usually behaves as though he were the center of the universe
69. If helping with a political campaign, I would be most interested in:
- a. collecting voter opinion and counter argument
 - b. assisting in the composition of campaign posters and publications
 - c. identifying crucial issues and helping to decide how the party platform shall face them
 - d. entertaining party leaders and personnel
70. The important thing to look for when buying a car is:
- a. performance
 - b. design
 - c. make and model
 - d. warranty and dealer service
71. Modern art is appreciated by a relative few because:
- a. it is not painted in a manner to which we are accustomed
 - b. usually the experience represented is common only to the artist
 - c. many of these paintings are fictitious both in subject and presentation.
 - d. many such paintings lack symbolic significance and thus prevent the perception of new relationships
72. When playing bridge or similar games I:
- a. follow a system of rules (such as Blackwood, Cazen, etc.)
 - b. plan my moves in terms of the action of other players
 - c. try to think my strategy through before playing
 - d. play the game by following cues which come to me spontaneously
73. I would choose the following topic for an essay:
- a. The life and outlook of Rene Descarte
 - b. The art and advantage of hypnosis
 - c. Surgery: its advantages and dangers
 - d. "Man shall not live by bread alone."

74. I would like to live in the country because:

- a. the current trend is toward more suburban living
- b. the hustle and bustle of city life leaves one little time to think
- c. one has the opportunity to be closer to nature
- d. "What is this life if full of care, we have no time to stand and stare"

75. God is known to me as:

- a. a father above me
- b. a spiritual presence within me
- c. a master craftsman or creator of all that is
- d. a being that gives meaning to life

76. More people are in church today than ever before because:

- a. church affiliation has become a symbol of status
- b. theologians are beginning to meet the minds of the educated people
- c. people are beginning to see that science can never be its own master
- d. the complexity of 20th century living draws heavily on man's spiritual resources.

77. For a love to last a couple must have:

- a. a similar world view
- b. similar moral and spiritual values
- c. similar disposition and temperament
- d. similar interests and pursuits

78. I enjoy a new situation when:

- a. stimulated mentally
- b. aroused emotionally
- c. challenged morally
- d. quickened spiritually

79. Funeral services have been justifiably criticized where:

- a. no tribute is paid the deceased or his family
- b. no word of comfort is spoken to the bereaved
- c. the funeral meditation does not seek to answer the nagging question, WHY?
- d. every attempt is made to hide the observable fact of death

80. For government to be good it should aim chiefly at:

- a. caring for the physical and psychological needs of its citizens
- b. forming reasonable and effective taxation policies
- c. providing good military and police protection
- d. making education available to all who are gifted

81. Most of those who loose touch with reality have:
- disregarded good guides for mental health
 - been marred emotionally in some way during their formative years
 - been inhibited by domineering partents
 - not had the chance for normal mental growth
82. "Music hath charm to soothe the savage breast." This has proven true because:
- the nautre of music is essentially intellectual
 - like most adages, it contains some of the real wisdom of common folk
 - music has the power to kindle the imagination
 - anything that affects our senses has profound influence
83. Most well read people are reasonably learned because they:
- become acquainted with the heart-felt longings of all peoples
 - come to know of the nature and function of the world around them
 - acquire an intellectual proficiency through the sifting of ideas
 - become familiar with the writings of great men in many fields
84. Responsibility among men requires:
- a fearless scrutiny of prejudice
 - loyalty to Christian precepts
 - an inherent sense of human equality
 - an honest appraisal of situations where irresponsibility has transpired
85. If I were visiting India, I would probably concentrate on:
- the old temples and mosques
 - observing the evidence of change and progress
 - the natural beauty of the country
 - the cultural differences between India and Western countries
86. The Bible is still a best seller today because it:
- is the basis and source of the Christian religion
 - contains some of the most beautiful prose and vivid images of all world literature
 - gives a meaningful account of man's relationship to God
 - contains some of the most impassioned and insightful illustrations of Man's communion with God
87. What is my feeling about guilt:
- leave it to the people concerned with alleviating it - psychiatrists and Ministers
 - guilt, in most cases, is unreasonable - "it needn't have been"
 - it provides, though in a negative way, new knowledge of the human organism
 - it is a significant, although poorly understood, human experience

88. I regard it quite important that a person be:

- a. honest with himself
- b. open to new views
- c. willing to listen to recognized counsel
- d. a keen observer of goings-on

89. What is my feeling about so-called mystical experience:

- a. it is not really beyond man's rational comprehension, if studied from the proper point of view
- b. it is just that--mystical, ineffable, providing a new outlook for the person who has received it
- c. if an objective onlooker had been present, the validity of the experience would likely have gone unverified
- d. many of man's great institutions have been founded on such experience

90. A person's sex life is better kept private because:

- a. not one great civilization has made it public
- b. only when kept private, can it bring a sense of unity and belonging to one's partner
- c. it is unthinkable that the sacred things of life should be put on parade
- d. a public display would detract greatly from the wealth of experience offered by discrete sexual practice

91. I would be most disturbed if accused of:

- a. the violation of established traditions and institutions
- b. being illogical or irrelevant in my beliefs
- c. being inaccurate or biased in my observations
- d. being insensitive to the needs of others

92. In a dangerous situation which kind of people are the best to have around

- a. observant
- b. insightful
- c. logical
- d. staunch

93. It is important that a church building be:

- a. built according to a proven plan
- b. symbolically constructed
- c. attractively designed
- d. functional

94. The most important feature of a Service of Worship is the:

- a. Sermon
- b. Organizational Coherence
- c. Communion
- d. Scripture Reading

1. The purpose of this document is to provide a summary of the results of the study.

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

2. The study was conducted in the following manner:

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

3. The study was conducted in the following manner:

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

4. The study was conducted in the following manner:

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

5. The study was conducted in the following manner:

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

6. The study was conducted in the following manner:

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

7. The study was conducted in the following manner:

- a. The study was conducted in the following manner:
- b. The results of the study are as follows:
- c. The study was conducted in the following manner:
- d. The results of the study are as follows:

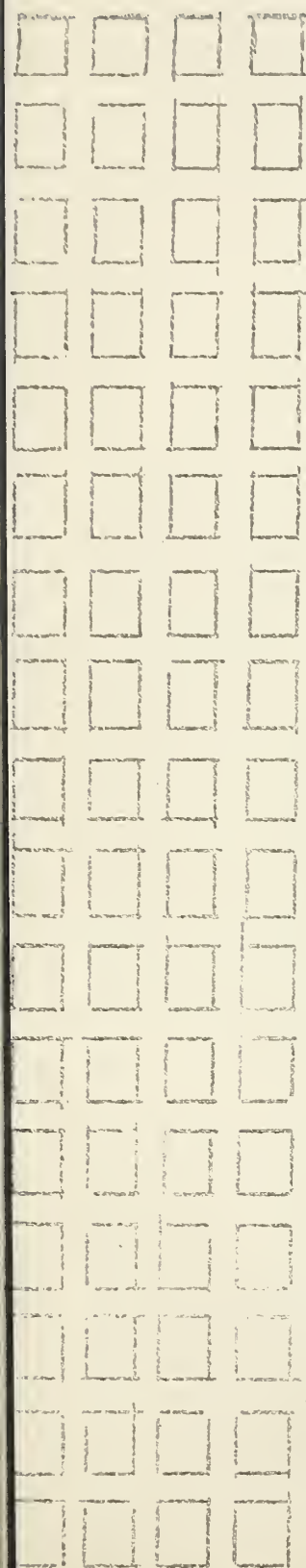
95. An important place in any city is the:
- a. court house
 - b. hospital
 - c. school
 - d. church or synagogue
96. The success of a public meeting depends largely on the:
- a. guest speaker
 - b. chairman
 - c. discussion
 - d. sincerity of purpose
97. A good driver is:
- a. courteous
 - b. observant
 - c. even tempered
 - d. fully versed in traffic regulations
98. The most attractive feature of travel by air is:
- a. time saved
 - b. the sense of separation from the work-a-day world
 - c. the class of people you meet
 - d. the interesting cloud formations so often seen
99. The country has been helped most in the last few years by:
- a. political leadership
 - b. business leadership
 - c. religious leadership
 - d. military leadership
100. The answer to world peace is to be found in:
- a. an emphasis on world brotherhood
 - b. a firm stand by the western powers
 - c. careful planning by the U.N.
 - d. scientific research for peace
101. I like to meet socially for:
- a. a game of bridge
 - b. cocktails and a floor show
 - c. contacts
 - d. fellowship

APPENDIX B

THE INVENTORY ANSWER SHEET

INVENTORY ANSWER SHEET

				Name									
a	b	c	d		a	b	c	d		a	b	c	d
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	35.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	36.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	37.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	38.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	39.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	40.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	41.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	43.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	44.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	45.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	46.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	47.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	48.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	49.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	33.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	34.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					



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APPENDIX C

AVERAGE RANK ORDER

SCORES AND SCALE SCORES

FOR ALL SUBJECTS ON THE FOUR SCALES

EMPIRICAL GROUP

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O	S.S	A.R.O	S.S	A.R.O	S.S	A.R.O
1.	.914	2.594	1.252	2.634	1.565	2.990	.304	1.782
2.	1.485	2.950	1.050	2.554	1.198	2.594	.499	1.901
3.	1.190	2.643	.937	2.347	1.538	2.960	.572	2.050
4.	1.008	2.703	1.317	2.624	1.285	2.723	.534	1.911
5.	1.138	2.758	1.181	2.515	1.662	2.778	.540	1.949
6.	.802	2.330	1.484	2.910	1.232	2.640	.653	2.200
7.	1.141	2.287	1.279	2.663	1.622	2.950	.372	1.803
8.	1.207	2.610	1.320	2.730	1.493	2.960	.258	1.680
9.	1.314	2.690	.981	2.450	1.329	2.830	.540	2.030
10.	.840	2.248	1.703	2.812	1.223	2.297	.775	2.208
11.	1.246	2.598	1.254	2.736	1.344	2.793	.325	1.874
12.	.962	2.356	1.234	2.723	1.281	2.733	.697	2.188
13.	1.470	2.927	1.004	2.542	1.308	2.688	.335	1.844
14.	1.375	2.762	.956	2.446	1.317	2.752	.639	2.040
15.	1.249	2.667	.905	2.424	1.435	2.985	.248	1.616
16.	1.229	2.716	1.116	2.409	1.588	2.920	.476	1.955
17.	1.168	2.588	1.098	2.639	.976	2.515	.785	2.258
18.	1.172	2.622	1.141	2.541	1.236	2.622	1.032	2.214
19.	1.319	2.695	.883	2.305	1.506	2.926	.604	1.547
20.	1.300	2.693	.880	2.287	1.337	2.743	.802	1.881
21.	1.274	2.723	1.102	2.574	1.468	2.901	.317	1.802
22.	1.383	2.726	.927	2.432	1.197	2.853	.494	1.989
23.	1.517	2.960	1.099	2.620	1.167	2.590	.309	1.803
24.	1.479	2.950	1.098	2.465	1.266	2.743	.375	1.842
25.	1.198	2.179	1.456	2.905	1.157	2.611	.330	1.905

Empirical Group (Contd.)

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O.	S.S	A.R.O.	S.S	A.R.O	S.S.	A.R.O
26.	1.142	2.256	1.311	2.711	1.507	2.989	.333	1.744
27.	1.252	2.644	1.309	2.723	1.393	2.881	.269	1.752
28.	1.372	2.800	.881	2.316	1.397	2.768	.696	1.905
29.	1.272	2.703	.851	2.218	1.447	2.861	.874	2.218
30.	1.305	2.733	1.015	2.525	1.513	2.891	.504	1.851
31.	1.308	2.729	1.248	2.667	1.489	2.875	.295	1.729
32.	1.278	2.663	1.383	2.806	1.150	2.602	.557	1.969
33.	1.262	2.580	1.088	2.540	1.416	2.800	.583	2.040
34.	1.324	2.800	.973	2.429	1.560	2.914	.409	1.857
35.	1.356	2.782	1.008	2.406	1.183	2.634	.726	2.178
36.	1.238	2.615	1.334	2.725	1.235	2.406	.527	2.022
37.	1.179	2.634	1.349	2.723	1.297	2.703	.509	1.941
38.	.988	2.505	1.447	2.881	1.279	2.703	.458	1.911
39.	1.345	2.798	.974	2.535	.881	2.465	.724	2.202
40.	.985	2.616	1.342	2.828	1.158	2.626	.354	1.929
41.	1.153	2.624	1.102	2.525	1.324	2.713	.732	2.168
42.	1.306	2.716	1.103	2.453	1.211	2.621	.768	2.200
43.	.989	2.505	.753	2.677	1.071	2.566	.770	2.354
44.	1.170	2.604	1.193	2.644	1.383	2.743	.562	2.010
45.	1.517	2.812	1.074	2.475	1.342	2.851	.343	1.752
46.	1.285	2.804	.838	2.485	1.503	2.959	.261	1.711
47.	1.260	2.276	1.314	2.680	1.351	2.760	.242	1.800
48.	1.098	2.584	1.151	2.802	1.354	2.673	.436	1.941

INTUITIVE GROUP

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O	S.S	A.R.O.	S.S	A.R.O	S.S	A.R.O
1.	.958	2.455	1.670	2.505	1.362	2.604	.913	2.366
2.	.935	2.376	1.632	2.723	1.103	2.525	.701	2.376
3.	1.142	2.500	1.369	2.811	1.274	2.511	.617	1.956
4.	1.103	2.317	1.425	2.713	1.175	2.604	.913	2.327
5.	1.187	2.584	1.071	2.238	1.055	2.574	1.005	2.406
6.	.940	2.307	1.549	2.842	1.221	2.604	.641	2.040
7.	1.054	2.515	1.422	2.832	1.197	2.515	.657	2.099
8.	1.012	2.347	1.316	2.693	1.103	2.525	.941	2.436
9.	1.029	2.525	1.213	2.515	1.393	2.792	.600	2.109
10.	1.256	2.683	1.102	2.495	1.210	2.634	.694	2.149
11.	1.382	2.733	1.007	2.465	1.337	2.743	.440	2.020
12.	.831	2.230	1.437	2.860	1.274	2.860	.726	2.230
13.	1.191	2.540	1.638	2.930	1.126	2.480	.597	2.010
14.	1.154	2.624	1.508	2.828	1.308	2.548	.681	2.000
15.	1.175	2.590	1.119	2.600	1.329	2.710	.712	2.070
16.	1.032	2.416	1.449	2.861	1.274	2.703	.572	2.020
17.	.923	2.317	1.632	3.010	1.279	2.644	.537	1.941
18.	1.021	2.406	1.375	2.762	1.207	2.584	.771	2.248
19.	.960	2.160	1.363	2.450	1.088	2.630	.762	2.020
20.	1.568	2.515	1.246	2.693	1.138	2.545	.733	2.248
21.	1.255	2.734	1.680	2.894	1.202	2.574	.145	1.798
22.	.931	2.290	1.785	2.030	1.405	2.830	.363	1.850
23.	1.099	2.465	1.611	3.069	1.238	2.703	.292	1.762
24.	1.218	2.242	1.805	2.152	1.077	2.576	.278	1.636
25.	1.181	2.564	1.105	2.584	1.437	2.842	.586	2.010

Intuitive Group (Contd.)

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O	S.S.	A.R.O.	S.S.	A.R.O.	S.S	A.R.O.
26.	.998	2.465	1.818	3.287	.894	2.356	.510	2.129
27.	1.181	2.610	1.437	2.540	1.227	2.660	.426	1.890
28.	.981	1.990	1.297	2.860	1.233	2.580	.892	2.370
29.	1.227	2.656	1.534	2.903	1.070	2.484	.597	1.957
30.	.973	2.429	1.425	2.847	1.088	2.490	.795	2.255
31.	1.211	2.673	1.393	2.802	1.221	2.634	.430	1.891
32.	1.127	2.584	1.503	2.940	1.153	2.564	.381	1.911
33.	1.215	2.641	1.636	2.033	1.256	2.533	.322	1.793
34.	1.333	2.706	1.038	2.478	1.510	2.913	.510	1.902
35.	1.263	2.704	1.367	2.796	.987	2.408	.492	2.092
36.	.735	2.149	1.715	3.079	1.250	2.644	.726	2.129
37.	1.211	2.442	1.954	2.988	1.325	2.512	.821	2.058
38.	.993	2.317	1.801	3.436	.997	2.327	.759	2.020
39.	1.169	2.646	1.599	2.980	1.123	2.475	.483	1.939
40.	1.226	2.639	1.402	2.794	1.161	2.577	.579	1.990
41.	1.065	2.560	1.625	2.600	1.059	2.430	1.088	2.370
42.	1.286	2.526	1.186	2.515	1.303	2.742	.741	2.175
43.	.799	2.455	1.330	2.713	1.287	2.743	.568	2.089
44.	1.092	2.574	1.565	2.980	1.090	2.515	.381	1.931
45.	1.119	2.495	1.576	2.970	1.400	2.851	.292	1.683
46.	1.449	2.770	1.541	2.625	1.119	2.531	.595	2.073
47.	.897	2.337	2.210	3.102	1.262	2.571	.475	1.949
48.	.954	2.347	1.701	2.990	1.033	2.634	.430	2.030
49.	1.194	2.611	1.607	2.937	.942	2.411	.618	2.042
50.	.857	2.317	1.653	3.050	1.349	2.762	.523	1.871

RATIONAL GROUP

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O	S.S	A.R.O	S.S.	A.R.O	S.S	A.R.O
1.	1.495	2.899	.867	2.273	1.243	2.626	.586	2.010
2.	1.202	2.716	.923	2.316	1.621	3.092	.302	1.874
3.	1.185	2.564	1.005	2.050	1.396	2.822	.763	2.168
4.	1.170	2.594	.989	2.446	1.457	2.594	.813	2.069
5.	1.496	2.892	1.047	2.419	1.283	2.699	.592	1.989
6.	1.200	2.600	1.088	2.630	1.419	2.880	.335	1.890
7.	1.130	2.554	1.324	2.693	1.361	2.782	.571	1.970
8.	1.101	2.584	1.303	2.713	1.339	2.792	.840	1.920
9.	1.183	2.564	1.015	2.545	1.410	2.851	.528	2.040
10.	1.329	2.747	1.037	2.519	1.156	2.608	.740	2.127
11.	1.260	2.646	.906	2.303	1.709	2.838	.805	2.212
12.	1.303	2.653	1.269	2.644	1.002	2.465	.808	2.257
13.	1.195	2.594	.899	2.356	1.460	2.921	.737	2.129
14.	1.212	2.659	.739	2.134	1.785	2.171	.497	2.037
15.	1.052	2.380	1.142	2.580	1.437	2.870	.713	2.150
16.	1.456	2.773	1.213	2.577	1.210	2.608	.570	2.041
17.	1.050	2.526	1.217	2.670	1.543	2.969	.314	1.835
18.	1.019	2.541	1.188	2.541	1.464	2.878	.595	2.071
19.	1.344	2.782	1.403	2.416	1.584	2.960	.315	1.792
20.	1.074	2.436	1.101	2.554	1.398	2.921	.639	2.089
21.	1.257	2.608	.931	2.361	1.523	2.969	.602	2.093
22.	1.209	2.673	1.395	2.950	1.122	2.545	.317	1.822
23.	1.055	2.465	1.347	2.743	1.753	2.069	.269	1.653
24.	1.170	2.596	1.419	2.840	1.296	2.755	.296	1.809
25.	1.190	2.604	.919	2.376	1.519	2.871	.726	2.376

Rational Group (contd.)

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O.	S.S	A.R.O	S.S	A.R.O	S.S	A.R.O
26.	.958	2.406	1.574	2.703	1.375	2.743	.712	2.109
27.	1.108	2.410	1.088	2.720	1.304	2.700	.685	2.170
28.	.900	2.333	1.412	2.714	1.577	2.810	.594	2.274
29.	1.076	2.515	1.199	2.505	1.807	3.062	.436	1.918
30.	.938	2.330	1.143	2.580	1.611	2.980	.635	2.110
31.	1.031	2.406	1.451	2.822	1.500	2.931	.400	2.832
32.	.850	2.505	1.424	2.919	1.556	3.051	.290	1.756
33.	.775	2.168	1.158	2.624	1.349	2.812	.802	2.436
34.	1.223	2.733	1.126	2.522	1.438	2.889	.333	1.856
35.	1.034	2.531	1.389	2.813	1.726	3.063	.250	1.635
36.	1.144	2.525	1.212	2.624	1.493	2.891	.485	1.960
37.	1.347	2.733	1.027	2.446	1.425	2.832	.495	1.970
38.	1.423	2.772	1.027	2.554	1.369	2.733	.544	1.881
39.	1.143	2.510	1.275	2.602	1.404	2.827	.567	2.000
40.	1.102	2.485	1.095	2.616	1.538	2.949	.493	1.919
41.	1.256	2.663	1.000	2.416	1.633	2.980	.550	1.970
42.	1.112	2.530	1.227	2.630	1.393	2.740	.635	2.070
43.	1.230	2.663	1.396	2.822	1.471	2.099	.248	1.624
44.	1.152	2.609	1.297	2.739	1.432	2.848	.330	1.804

AUTHORITARIAN GROUP

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O	S.S.	A.R.O	S.S	A.R.O	S.S	A.R.O
1.	1.344	2.022	.835	2.238	1.486	2.941	.440	2.040
2.	.942	2.396	1.493	2.812	1.333	2.723	.395	1.931
3.	1.386	2.762	.936	2.297	1.268	2.693	.761	2.208
4.	1.238	2.594	.988	2.436	1.620	3.010	.802	1.960
5.	1.252	2.594	1.163	2.594	1.324	2.723	.652	2.089
6.	.850	2.277	1.105	2.624	1.416	2.832	.842	2.495
7.	1.209	2.653	.832	2.317	1.383	2.762	.850	2.267
8.	1.388	2.828	.915	2.313	1.437	2.869	.509	1.990
9.	1.350	2.832	.997	2.376	1.565	2.584	.340	1.812
10.	1.098	2.416	1.143	2.663	1.503	2.861	.610	2.158
11.	1.171	2.559	1.043	2.505	1.131	2.495	.981	2.441
12.	1.197	2.570	1.215	2.620	1.337	2.790	.578	2.020
13.	1.063	2.500	1.098	2.620	1.370	2.780	.604	2.100
14.	1.051	2.545	1.136	2.535	1.282	2.663	.926	2.277
15.	1.112	2.515	.976	2.406	1.502	2.941	.715	2.139
16.	.981	2.420	1.268	2.600	1.440	2.890	.595	2.090
17.	1.164	2.520	1.191	2.550	1.480	2.920	.635	2.010
18.	1.116	2.306	1.137	2.480	1.539	2.878	.631	2.020
19.	1.110	2.500	.943	2.550	1.304	2.660	1.019	2.410
20.	.985	2.426	1.285	2.644	1.317	2.822	.726	2.109
21.	1.194	2.535	.835	2.287	1.683	3.138	.646	2.040
22.	1.303	2.762	.975	2.416	1.192	2.871	.454	2.178
23.	1.310	2.780	1.039	2.450	1.458	2.870	.349	1.900
24.	1.985	2.416	1.352	2.762	1.662	3.109	.322	1.713
25.	.932	2.376	1.317	2.733	1.565	2.713	.672	2.178

Authoritarian Group (Contd.)

Judge	E Scale		I Scale		R Scale		A Scale	
	S.S	A.R.O	S.S	A.R.O	S.S	A.R.O	S.S	A.R.O
26.	1.499	2.980	.821	2.238	1.865	2.980	.354	2.099
27.	1.128	2.556	.994	2.396	1.397	2.733	.640	2.211
28.	1.077	2.525	1.318	2.879	1.475	2.929	.256	1.667
29.	1.055	2.488	1.129	2.525	1.644	3.000	.585	1.990
30.	1.282	2.470	1.114	2.550	1.168	2.610	.984	2.370
31.	1.205	2.624	1.061	2.218	1.259	2.614	1.105	2.545
32.	1.262	2.653	.993	2.455	1.582	3.000	.473	1.891
33.	.967	2.370	1.311	2.700	1.460	2.860	.644	2.070
34.	1.186	2.604	1.029	2.485	1.415	2.851	.567	2.059
35.	1.390	2.822	1.018	2.416	1.415	2.832	.494	1.921
36.	1.037	2.511	1.262	2.687	1.295	2.677	.672	2.354
37.	1.386	2.822	1.180	2.554	.942	2.426	.739	2.198
38.	1.228	2.723	.971	2.416	1.407	2.822	.528	2.040
39.	.926	2.416	1.212	2.604	1.394	3.119	.791	2.188
40.	1.140	2.574	.877	2.535	1.426	2.851	.771	2.267
41.	1.046	2.446	1.247	2.703	1.588	2.584	.530	1.960

APPENDIX D.

CORRELATION COEFFICIENT SCATTER PLOTS

A.R.O. SCORES \longleftrightarrow SCALE VALUES

ON THE

AUTHORITARIAN INTUITIVE AND RATIONAL

SCALES

A Scale

I Scale

R Scale

3

AVERAGE RANK ORDER SCORES

1

APPENDIX D

Correlation Coefficient Scatter Plots

A.R.O. - Scale Values



SCALE SCORES

1

2

1

2

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